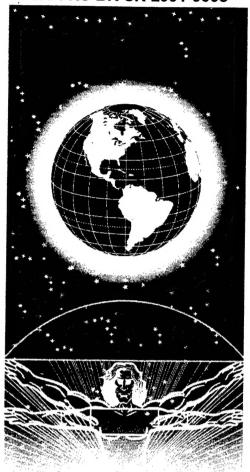
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UNITED STATES AIR FORCE IERA

Medical Waste Incinerator
Emissions Test
Malcolm Grow Medical Center,
Building 1056,
Andrews Air Force Base, Maryland

Pacific Environmental Services, Inc. 560 Herndon Parkway, Suite 200 Herndon, VA 20170-5240

April 2001

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Air Force Institute for Environment, Safety and Occupational Health Risk Analysis Risk Analysis Directorate Environmental Analysis Division 2513 Kennedy Circle Brooks Air Force Base TX 78235-5123

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ACRONYM AND ABBREVIATION LIST

AFB Air Force Base

AFIERA Air Force Institute for Environmental Safety and Occupational Health

Risk Analysis

Alta Analytical Perspectives

ASTM American Society of Testing Materials

BSM Base Surveillance Monitor

Cd cadmium

CEMs continuous emission monitors

CO carbon monoxide CO₂ carbon dioxide

COMAR Code of Maryland Air Regulations

°F degrees Fahrenheit

EPA United States Environmental Protection Agency

FAL First Analytical Laboratories

GC/MS gas chromatography/mass spectrometry

GFC Gas Filter Correlation HCl hydrogen chloride

Hg mercury
ID inner diameter
lb/hr pounds per hour

MDE Maryland Department of the Environment

MWI medical waste incinerator

N2 nitrogen

NO nitrogen oxide NO, oxides of nitrogen

 O_2 oxygen

OSHA Occupational Safety and Health Administration

% percent Pb lead

PCDD/PCDF dioxins/dibenzofurans

PES Pacific Environmental Services, Inc.

PM particulate matter

ppmv parts per million by volume QA/QC quality assurance/quality control

SO₂ sulfur dioxide

TPM Technical Project Manager

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1.0 INTRODUCTION

The Malcolm Grow Medical Center operates a medical waste incinerator (MWI) at Andrews Air Force Base (AFB), Maryland. The MWI is permitted to burn Type O and infectious/pathological wastes and has a design (rated) capacity of 385 pounds per hour (lb/hr) for this type waste.

The MWI is operated under authority of Maryland Department of the Environment (MDE) Operating Permit No. 16-00655. The MWI is subject to the new MDE standards for medium size incinerators, "Requirements for the Control of Emissions from Hospital Medical Infectious Waste Incinerators," Code of Maryland Air Regulations (COMAR) 26.11.08. These standards are derived from emission guidelines and compliance schedules published by the United States Environmental Protection Agency (EPA) on 15 September 1997 and implement sections 111(d) and 129 of the Clean Air Act and established emission limits for particulate matter (PM), carbon monoxide (CO), dioxins/dibenzofurans (PCDD/PCDF), hydrogen chloride (HCI), sulfur dioxide (SO₂), oxides of nitrogen (NO_x), lead (Pb), cadmium (Cd), and mercury (Hg). Initial performance testing was required for PM, CO, PCDD/PCDF, HCI, Pb, Cd, Hg, and opacity. In addition, the MDE required tests for SO₂ and NO_x.

Under contract to the United States Air Force Institute for Environmental Safety and Occupational Health Risk Analysis (AFIERA), Pacific Environmental Services, Inc. (PES) conducted the required testing during the period 31 January through 2 February 2001. The AFIERA point of contact and Technical Project Manager (TPM) for this delivery order was:

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2.0 RESULTS SUMMARY

The emissions results summary is shown in Table 2.1.

TABLE 2.1
EMISSIONS RESULTS SUMMARY

Run No./Date	1	2	3	Average	Standard*
Particulate Matter	2/2	2/2	2/2		
mg/dscm@7% O ₂	8	104	93	68	69
Carbon Monoxide	2/1	2/1	2/2		•
ppmvd@7% O ₂	< 2	< 2	< 2	< 2	40
Dioxins/Furans	1/31	1/31	2/1		
ng/dscm total CDD/CDF@7% O ₂	1	1	< 1	< 1	125
Hydrogen Chloride	1/31	2/1	2/2		
ppmvd@7% O ₂	23	3	9	12	100
Sulfur Dioxide	2/1	2/1	2/2		
ppmvd@7% O ₂	< 2	3	< 2	< 2	55
Nitrogen Oxides	2/1	2/1	2/2		
ppmvd@7% O ₂	102	100	96	99	250
Lead	2/2	2/2	2/2		
mg/dscm@7% O ₂	0.6	0.8	0.6	0.7	1.2
Cadmium	2/2	2/2	2/2		
mg/dscm@7% O ₂	0	0.01	0.01	0.01	.16
Mercury	2/2	2/2	2/2		
mg/dscm@7% O ₂	0.09	0.01	0.00	0.03	0.55
Visual Opacity, %	2/2	2/2	2/2		
	0-5	0-5	0-5	0-5	10

^{*} MDE COMAR 26.11.08

3.0 SOURCE DESCRIPTION

The MWI is a Joy Energy Systems Model 480-E incinerator consisting of both a primary (lower) and a secondary (upper) combustion chamber. The primary chamber is equipped with an on/off natural gas burner and a manually adjusted underfife air blower. The secondary chamber is equipped with a modulating high/low natural gas burner. Additional combustion air is supplied by a modulating blower, located between the primary and secondary chambers. The primary and secondary combustion chambers operate at temperatures of approximately 1665°F and 1695°F, respectively.

The incinerator is utilized to burn Type O and infectious/pathological waste generated at the hospital. The rated capacity is 385 lb/hr. Loading of waste is accomplished with the use of a hopper/hydraulic ram mechanical waste feed system. Continuous monitoring instrumentation for the incinerator includes thermocouples and a circular chart recorder for recording primary and secondary combustion chamber temperature.

Particulate air emissions are controlled with an Airpol high energy venturi scrubber. Caustic sodium hydroxide is added to the scrubber to enhance removal of acid gases. The scrubber liquid is recirculated through the venturi system with a specified amount bled off and replaced with fresh make-up liquid. A stainless steel impact mist eliminator, located downstream of the venturi, helps control the amount of entrained water droplets carried over to the fan and stack. Continuous monitoring instrumentation for the scrubber includes a draft gage for measuring the pressure drop across the venturi, a thermocouple for measuring the venturi inlet gas temperature, a flow meter for measuring the scrubber liquid flow rate, and a meter for measuring the pH of the scrubber liquid.

4.0 SAMPLING LOCATION

The MWI is located in a single-story building. The stack extends vertically through the roof and to a height of about 10 feet above the roof. The sampling site for the manual sampling was located inside the MWI building in a 15-3/8 inch inner diameter (ID) round vertical stack, 170 inches (11.1 stack diameters) downstream of the nearest flow disturbance (fan outlet) and 175 inches (11.4 stack diameters) upstream of the nearest flow disturbance (atmosphere). According to EPA Method 1 criteria, this location requires 12 sample traverse points, 6 along each of 2 perpendicular diameters. Sampling was accomplished through two existing 3-inch ID test ports. The sample traverse point locations are shown in Figure 4.1. A separate test port for the portable continuous emission monitor (CEMs), which were used for the instrumental methods, was installed about 48 inches upstream of the manual methods sampling site. Access to the manual sampling location was provided by scaffold and staging, approved by the Occupational Safety and Health Administration (OSHA), erected by PES.

Although cyclonic flow conditions were not expected at the sampling locations, PES performed a check to verify the absence of cyclonic or nonparallel flow in accordance with the procedure specified in Section 2.4 of EPA Method 1. The results indicated an average angle of rotation of 0 degrees to obtain a null velocity reading.

Circular Stack Method 1 Calculation Results

Date: 03/23/01

Time: 10:23:10

Facility: Malcolm Grow Med. Center MWI

Source ID: C2 (MWI)

Source Name: Joy Energy Systems MWI

Date: 01/31/01

Calculated By: F. Meadows

Input Values

Traverse Point Type: Sample - M5

Inside of far wall to outside of nipple: 17 3/8 (inches)

Nipple Length: 2 even (inches)

Distance from Upstream Disturbance: 170 even (inches)
Distance from Downstream Disturbance: 175 even (inches)

Number of ports: 2 ports at 90 degrees

Calculated Values

Inside Diameter: 15.3750 (inches)

Upstream Duct Diameters: 11.05
Downstream Duct Diameters: 11.38
Mininum Traverse Points: 12

Traverse	Fraction		Product of	Nipple	Traverse 26/m
Point Number	of Length	Length (inches)	Columns 2 & 3	Length (inches)	Location Sum of Col. 4 & 5
1	0.044	15 3/8	0 11/16	2 even	2 11/16
2	0.146	15 3/8	2 1/4	2 even	4 1/4
3	0.296	15 3/8	4 9/16	2 even	6 9/16
4	0.704	15 3/8	10 13/16	2 even	12 13/16
5	0.854	15 3/8	13 1/8	2 even	15 1/8
6	0.956	15 3/8	14 11/16	2 even	16 11/16

Figure 4.1 MWI Sample Traverse Point Locations

5.0 SAMPLING AND ANALYTICAL PROCEDURES

Table 5.1 summarizes the test parameters, test methods, number of tests, and duration of each sampling event. Brief descriptions of the methods conducted are provided below.

5.1 LOCATION OF MEASUREMENT SITES AND SAMPLE /VELOCITY TRAVERSE POINTS

EPA Method 1, "Sample and Velocity Traverses for Stationary Sources," was used to select the measurement site and to establish velocity and sample traverse point locations. The measurement site is discussed in Section 4.0.

5.2 DETERMINATION OF STACK GAS VOLUMETRIC FLOW RATE

EPA Method 2, "Determination of Stack Gas Velocity and Volumetric Flow Rate (Type S Pitot Tube)," was used to determine stack gas volumetric flow rate. A Type S pitot tube, constructed according to Method 2 criteria and having an assigned coefficient of 0.84, connected to an inclined-vertical manometer, was used to measure velocity pressure. A calibrated Type K thermocouple attached directly to the pitot tube was used to measure stack gas temperature. The average stack gas velocity was calculated from the average square roots of the velocity pressure, average stack gas temperature, stack gas molecular weight, and absolute stack pressure. The volumetric flow rate is the product of stack gas velocity and the stack cross-sectional area.

TABLE 5.1
TEST PARAMETERS AND TEST METHODS SUMMARY

Parameter	EPA Test Methods	No. of Tests	Time per Test (minutes)
Volumetric Flow Rate	1 & 2	3	240
Molecular Weight, Emission Correction Factors	3A	_8	_8
Moisture	4	6 ^b	3 @ 60 each 3 @ 240 each
Sulfur Dioxide	6C	3	60
Nitrogen Oxides	7E	3	60
Carbon Monoxide	10	3	60
Dioxin/Furan (PCDD/PCDF)	23	3	240
Particulate Matter/Metals	5/29	3	60
Hydrogen Chloride	26	3	60

Continuous with all manual and CEM pollutant measurement runs.

^b Moisture content was determined using both the M23 and M5/29 sample trains.

5.3 DETERMINATION OF DRY MOLECULAR WEIGHT AND EMISSION CORRECTION FACTORS

EPA Method 3A, "Determination of Oxygen and Carbon Dioxide Concentration in Emissions From Stationary Sources (Instrumental Analyzer Procedure)," was used to determine oxygen (O₂) and carbon dioxide (CO₂) content of the stack gas. This procedure was part of the extractive continuous emission monitoring apparatus described in Section 5.8.

5.4 DETERMINATION OF STACK GAS MOISTURE CONTENT

EPA Method 4, "Determination of Moisture Content in Stack Gases," was used to determine stack gas moisture content. Moisture was determined using both the EPA Method 23 and EPA Method 29 sample trains. The quantity of condensed water was determined gravimetrically and then compared to the dry volume of gas sampled to determine the volume % moisture content. The moisture values obtained from the Method 23 and Method 29 sample trains were also used to adjust the SO_2 , NO_x , and CO concentrations to $7\% O_2$.

5.5 DETERMINATION OF POLYCHLORINATED DIBENZO-P-DIOXINS AND POLYCHLORINATED DIBENZOFURANS

EPA Method 23, "Determination of Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans From Stationary Sources," was used to determine total PCDD/PCDF. Samples were withdrawn from the gas stream isokinetically and collected via the sample probe onto a glass fiber filter, followed by a packed column of XAD-2 adsorbent material. The PCDD/PCDF were extracted from the samples and analyzed using high resolution gas chromatography/mass spectrometry (GC/MS). PES selected Alta Analytical Perspectives (Alta),

Wilmington, North Carolina, to prepare the filters and adsorbent traps and to perform the required analyses.

A schematic of the Method 23 sampling apparatus is shown in Figure 5.1. Each measurement run was 4 hours in duration, as required by 40 CFR, Part 60, Subpart Ec, Paragraph 60.56c(b)(9).

5.6 DETERMINATION OF HYDROGEN CHLORIDE

EPA Method 26, "Determination of Hydrogen Chloride Emissions From Stationary Sources," was used to determine HCl emissions. An integrated sample was withdrawn from the stack and passed through a prepurged heated probe and filter into a series of midget impingers containing dilute sulfuric acid and dilute sodium hydroxide solutions, which collected gaseous hydrogen halides and halogens. A schematic of the Method 26 sampling train is shown in Figure 5.2. Each measurement run was 1 hour in duration. PES selected First Analytical Laboratories (FAL), Chapel Hill, North Carolina, to perform the required analyses.

5.7 DETERMINATION OF PARTICULATE MATTER AND METALS

EPA Method 29, "Determination of Metals Emissions From Stationary Sources," was used to determine filterable particulate matter and metals. The target metals included Cd, Pb, and Hg. Samples were withdrawn from the gas stream isokinetically and collected via the sample probe onto a tared quartz-fiber filter, followed by a series of impingers containing aqueous acidic solutions of hydrogen perioxide (analyzed for Cd and Pb) and an aqueous acidic solution of potassium permanganete (analyzed for Hg). The probe filter fractions were analyzed

Figure 5.1 EPA Method 23 Sampling Apparatus

Figure 5.2 EPA Method 26 Hydrogen Chloride Sampling Apparatus

gravimetrically in the PES laboratory in Research Triangle Park, North Carolina, to determine filterable particulate matter. Upon completion of the particulate matter analyses, the particulate fractions and aqueous fractions were submitted to FAL for the metals analyses.

A schematic of the Method 29 sampling train is shown in Figure 5.3. Each measurement run was 1 hour in duration.

5.8 SULFUR DIOXIDE, OXIDES OF NITROGEN, AND CARBON MONOXIDE

SO₂, NO_x, and CO concentrations were measured using instrumental analyzers in accordance with EPA Methods 6C, 7E, and 10. An extractive sampling system was setup as shown in Figure 5.4. Although EPA Methods 6C, 7E, and 10 require a heated sample probe, Bill Reamy of the MDE approved the use of an unheated sample probe. This deviation from the method eliminated the need to install costly additional test ports in the stack. The sampling system consisted of a short sample probe about 8 inches in length, a heated out-of-stack filter, a calibration valve assembly, a short heated Teflon sample line, a sample gas conditioner (chiller), an unheated Teflon sample transport line, and a sample gas manifold to direct the sample gas to the analyzers.

The SO₂ analyzer was a Western Research Model 721 ATM unit that uses the analytical technique of ultraviolet fluorescence. The instrument had user-defined ranges of 50 to 5000 parts per million by volume (ppmv). The instrument was calibrated using SO₂-in-nitrogen (N₂) calibration gases prepared in accordance with EPA Protocol. Two upscale calibration gases corresponding to 40-60 and 80-100% of span and zero gas (ambient air) were used. The instrument was operated on a 0-100 ppmv range.

Figure 5.3 EPA Method 5/29 Particulate Matter/Metals Sampling Apparatus

5-8

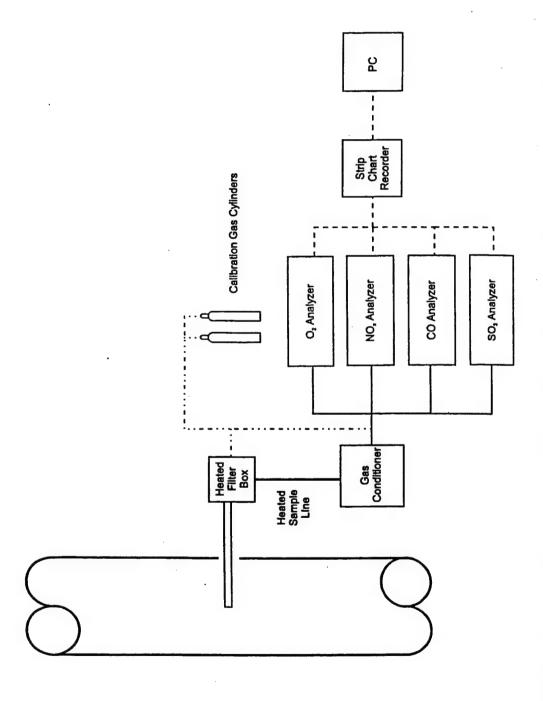


Figure 5.4 EPA Methods 3A, 6C, 7E, and 10 Instrumental Methods Extractive Sampling/Monitoring System

The NO_x analyzer was an API unit that uses the principle of chemiluminescence to determine the NO_x concentration continuously. The instrument was operated on the range of 0-500 ppmv as nitrogen oxide (NO). The instrument was calibrated using NO-in-N₂ calibration gases prepared in accordance with EPA Protocol. Two upscale calibration gases corresponding to 40-60 and 80-100% of span, and zero gas (ambient air) were used. Prior to testing, the NO₂ to NO conversion efficiency was checked in accordance with the procedures in Section 5.6.1 of EPA Method 20.

The CO analyzer was a Thermo Environmental Instruments Model 48C Gas Filter Correlation (GFC) unit that uses the principle of infrared absorption. The GFC system responds specifically to CO, so it was not necessary to make a CO_2 correction as specified in Section 9 of Method 10. The instrument was operated on the range of 0-100 ppmv. The instrument was calibrated using three upscale CO-in- N_2 calibration gases corresponding to approximately 30, 60, and 90% of span. Prepurified N_2 was used for the zero gas. The gases were certified by the manufacturer to be within $\pm 2\%$ of the specified concentration.

Pretest preparations included calibration error checks, sampling system bias checks, and response time checks for the respective analyzers. Post-test checks included zero and calibration drift tests. The output signal from each instrument was continuously recorded using a strip chart recorder and data logger.

5.9 DETERMINATION OF VISUAL OPACITY

EPA Method 9, "Visual Determination of the Opacity of Emissions From Stationary Sources," was used to determine visual opacity. PES provided a certified observer to observe and record opacity of the plume where condensed water was not present.

6.0 QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES

This section describes the specific quality assurance/quality control (QA/QC) procedures employed by PES in performing this series of tests. The goals of the QA/QC activities for this project were intended to ensure, to the highest degree possible, the accuracy of the data collected. The procedures contained in the "Quality Assurance Handbook for Air Pollution Measurement Systems, Volume III, Stationary Source Specific Methods," EPA-600/R-94/038C, served as the basis for the performance of all testing and related work activities on this project. All calibration requirements were met by the sampling equipment used to conduct this test program.

6.1 CALIBRATION OF APPARATUS

The preparation and calibration of source sampling equipment is essential in maintaining data quality. Brief descriptions of the calibration procedures used by PES are presented below.

6.1.1 Barometers

PES uses aneroid barometers that are calibrated against a station pressure value reported by a nearby National Weather Service Station, corrected for elevation.

6.1.2 Temperature Sensors

Bimetallic dial thermometers and Type K thermocouples are calibrated using the procedure described in Section 3.4.2 of EPA's Quality Assurance Handbook.

Each temperature sensor was calibrated over the expected range of use against an American Society for Testing Materials (ASTM) 3C or 3F thermometer. Table 6.1 summarizes the types of calibrations performed and the acceptable levels of variance. Potentiometers were calibrated using a thermocouple simulator having a range of 0-2400°F.

6.1.3 Pitot Tubes

PES used Type S pitot tubes that were constructed to EPA Method 2 specifications. Pitot tubes meeting these criteria are assigned a baseline coefficient of 0.84 and need not be calibrated.

6.1.4 <u>Differential Pressure Gages</u>

PES used Dwyer inclined and inclined/vertical manometers to measure differential pressures. These parameters included velocity pressure, static pressure, and meter orifice pressure. Manometers were selected with sufficient sensitivity to accurately measure pressures over the entire range of expected values. Manometers are primary standards and require no calibration.

6.1.5 Dry Gas Meters and Orifices

Dry gas meters and orifices were calibrated in accordance with Section 3.3.2 of EPA's Quality Assurance Handbook. This procedure involved direct comparison of the dry gas meter to a reference dry test meter. The reference dry test meter was calibrated using a wet test meter or a liquid displacement technique. Before its initial use in the field, the metering system was calibrated over the entire range of operation. After each field use, the metering system was calibrated at a single intermediate setting based on the previous field test.

TABLE 6.1

SUMMARY OF TEMPERATURE CALIBRATIONS

			/C	CALIBRATION MEDIA	IEDIA	·	
Temperature Sensor	Number of Calibration Points	lce Bath (0°C)	Ambient Air (20-25°C)	Hot Water (40-50°C)	Boiling Water (100°C)	Heated Oil (150- 200°C)	Tolerances
Impinger Outlet Thermocouple	2	*	*				±1°C
Dry Gas Meter Thermometer	2		*	*			±3°C
Stack Temperature Sensor	ဇ	*			*	*	±1.5°C of reference temperature

*: designates calibration point.

Acceptable tolerances for the initial and final dry gas meter factors and orifice calibration factors are \pm 0.02 and \pm 0.20 from average, respectively.

6.2 ON-SITE QA/QC

The on-site QA/QC activities are discussed below.

6.2.1 Measurement Sites

Prior to sampling, all stack dimensions were checked to verify measurement site locations, location of test ports, and inside stack dimensions. Inside dimensions were checked through all available test ports to verify uniformity of the stack cross-sectional area, and the sample test ports were checked to verify that they did not extend beyond the inside wall. The inside stack dimensions, wall thickness, and sample port depths were measured to the nearest 1/16 inch.

6.2.2 Velocity Measurements

All velocity measurement apparatus was assembled, leveled, zeroed, and leak-checked prior to use and at the end of each determination. The static pressure was determined at a single point near the center of the stack cross section.

6.2.3 Integrated Flue Gas Sampling

Integrated multipoint flue gas samples were collected in Tedlar[®] gas bags by traversing the stack cross-sectional area simultaneously with each PM/metals and PCDD/PCDF measurement run. The sample train was assembled and

leak-checked before and after each test run. Prior to each test run, the gas bags were leak-checked and purged with nitrogen to ensure that no contamination of the sample occurred.

During sampling, Fyrite combustion gas analyzers were used to determine concentrations of CO₂ and O₂. These instruments were used as a confirmatory technique for the Orsat analysis.

6.2.4 Moisture

Stack gas moisture content was determined simultaneously using both the PM/metals and the PCDD/PCDF sample trains. During sampling, the exit gas of the last impinger was maintained below 68°F to ensure complete condensation of the stack gas water vapor. The total moisture was determined gravimetrically and included the condensate collected in the Method 23 adsorbent trap.

6.2.5 <u>Sulfur Dioxide, Oxides of Nitrogen, and Carbon Monoxide Instrumental</u> <u>Methods</u>

The on-site QC requirements for EPA Methods 6C, 7E, and 10 included the following:

Analyzer Calibration Error – Less than $\pm 2\%$ of the span for the zero, mid-range, and high-range calibration gases.

Sampling System Bias – Less than ±5% of the span for the zero and mid- or high-range calibration gases.

<u>Calibration Drift</u> - Less than $\pm 3\%$ of the span over the period of each run.

EPA Methods 6C and 7E required the use of calibration gases prepared according to EPA Protocol and certified to be within $\pm 1\%$ of the specified concentrations. EPA Method 10 required the use of calibration gases that were certified to be within $\pm 2\%$ of the specified concentrations. Additional QC checks included upand down-scale response time checks.

6.2.6 Dioxin/Furan (PCDD/PCDF)

The field sampling QA/QC procedures were similar to those for PM/metals. The adsorbent cartridges were spiked with surrogate standards in the laboratory prior to collecting the field samples.

6.2.7 Particulate Matter/Metals and Hydrogen Chloride

The field sampling QA/QC procedures included the cleaning and preparation of all sampling train glassware and sample containers, use of prescribed reagents and filters, pre- and post-test leak checks of the sampling apparatus, sample recovery as prescribed in the proposed method, and retention of unused filters and reagents for use as blanks.

6.2.8 Sample Handling and Chain-of-Custody

All samples not analyzed on site (PCDD/PCDF, HCI, PM/metals) were logged into a master logbook and given an alpha-numeric identification code. The samples were clearly labeled and sealed. Samples were stored in an area of limited access. Upon completion of the particulate analyses in the PES laboratory in Research

Triangle Park, North Carolina, the PCDD/PCDF, HCI, and metals samples were hand-delivered to PES' contract laboratories for analyses. A chain-of-custody report form accompanied all samples delivered to each laboratory and documented all handling through final disposition.

6.3 ANALYSIS

6.3.1 Particulate Matter/Metals

Analysis for particulate matter was performed in the PES laboratory. Field blanks of acetone were taken directly from the wash bottle used in recovering the samples. Three (3) blank filters were also exposed and handled at the sample recovery site. The acetone blank and filter blanks were submitted to the laboratory and analyzed with the samples.

Upon receipt of the samples at the PES laboratory, the samples and blanks were analyzed in strict accordance with Section 4.3 of EPA Method 5. Prior to any weighings, PES' analytical balance was checked for calibration with known weights.

The sample and blank filters were placed in a tared glass weighing dish and desiccated for 24 hours in a desiccator containing anhydrous calcium sulfate. The filters were weighed to a constant weight and the results reported to the nearest 0.1 mg. The term "constant weight" means a difference of no more than 0.5 mg or 1% of total weight less tare weight, whichever is greater, between two consecutive weighings, with no less than 6 hours of desiccation time between weighings. The sample and blank acetone solutions were checked to confirm the level of liquid in the containers in order to determine whether or not leakage occurred during transport. If a noticeable amount of leakage had occurred, the

sample was voided, or other methods were used such as adjusting the final analysis for the amount of spillage. The liquid in each sample container was measured gravimetrically to \pm 0.5 g. The contents were transferred to a tared 250-ml beaker and evaporated to dryness at ambient temperature and pressure. The beakers were then desiccated for 24 hours and weighed to a constant weight. The results were reported to the nearest 0.1 mg. Filterable particulate matter was the sum of the particulate matter in the acetone rinse (blank corrected) and that caught on the filter.

Upon completion of the particulate analyses, these samples, along with the metals train aqueous samples, were hand-delivered to FAL for determination of the target metals following the analytical and quality control procedures prescribed in Method 29. The samples were delivered to FAL within 6 working days after the completion of the field tests. The analyses were performed within 21 working days after receipt of the samples by FAL.

6.3.2 Dioxin/Furan (PCDD/PCDF)

The PCDD/PCDF samples were submitted to Alta for analysis following the procedures prescribed in Section 5 of Method 23 and proposed revisions. GC/MS system checks included initial calibration and daily performance checks. Specific QC checks included the determination of internal standard recovery efficiencies and the determination of surrogate recoveries. Recoveries of internal standards must be between 40 to 130% for the tetra-through hexachlorinated compounds, while the range is 25 to 130% for the higher hepta- and octachlorinated homologues. Surrogate recovery efficiencies were required to be between 70 and 130%.

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PPENDIX A
OCESS DATA

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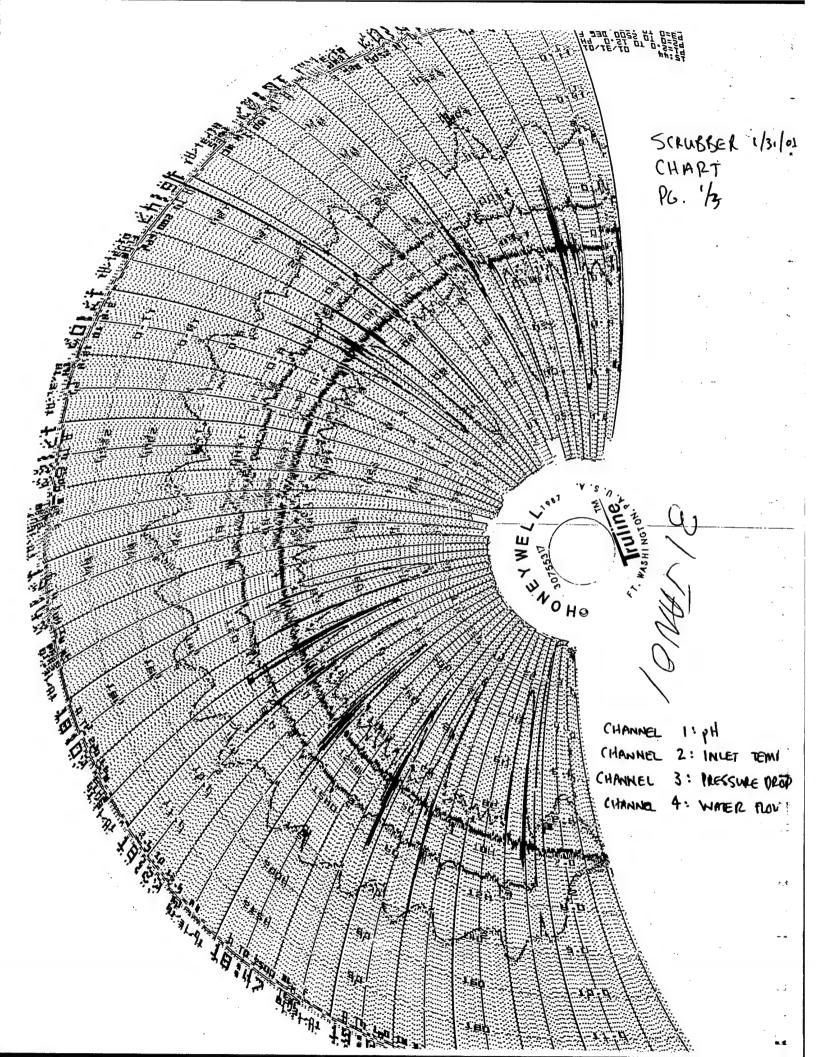
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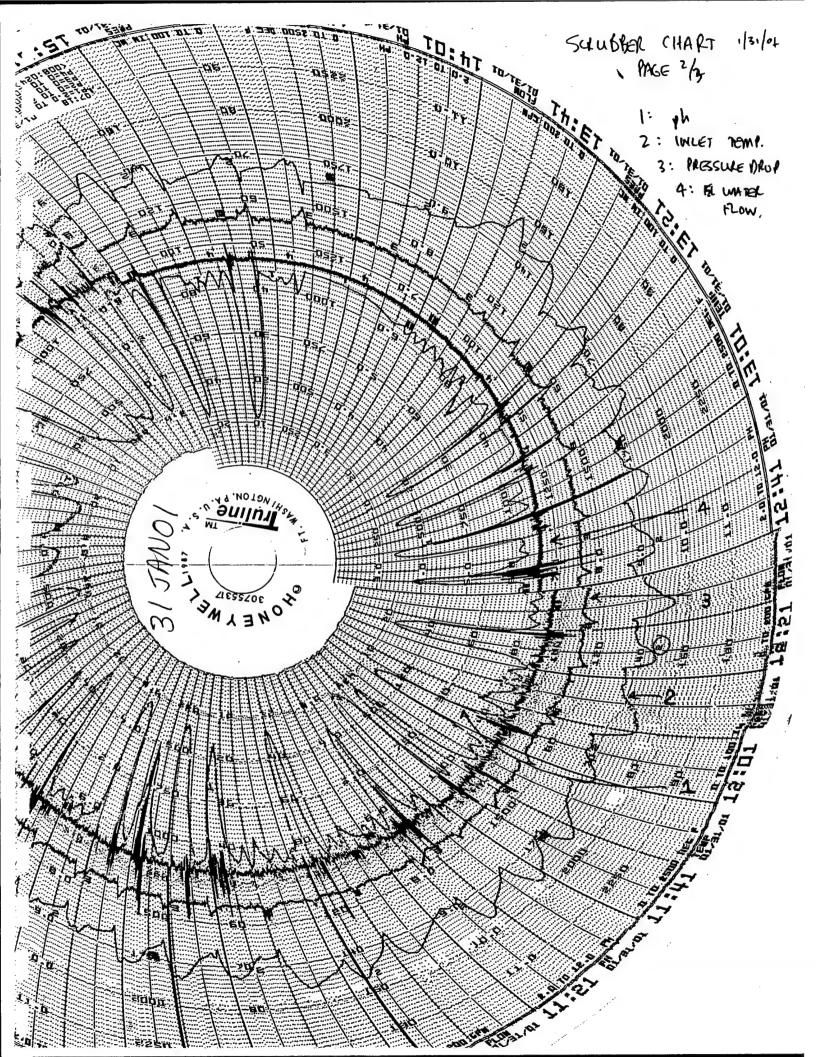
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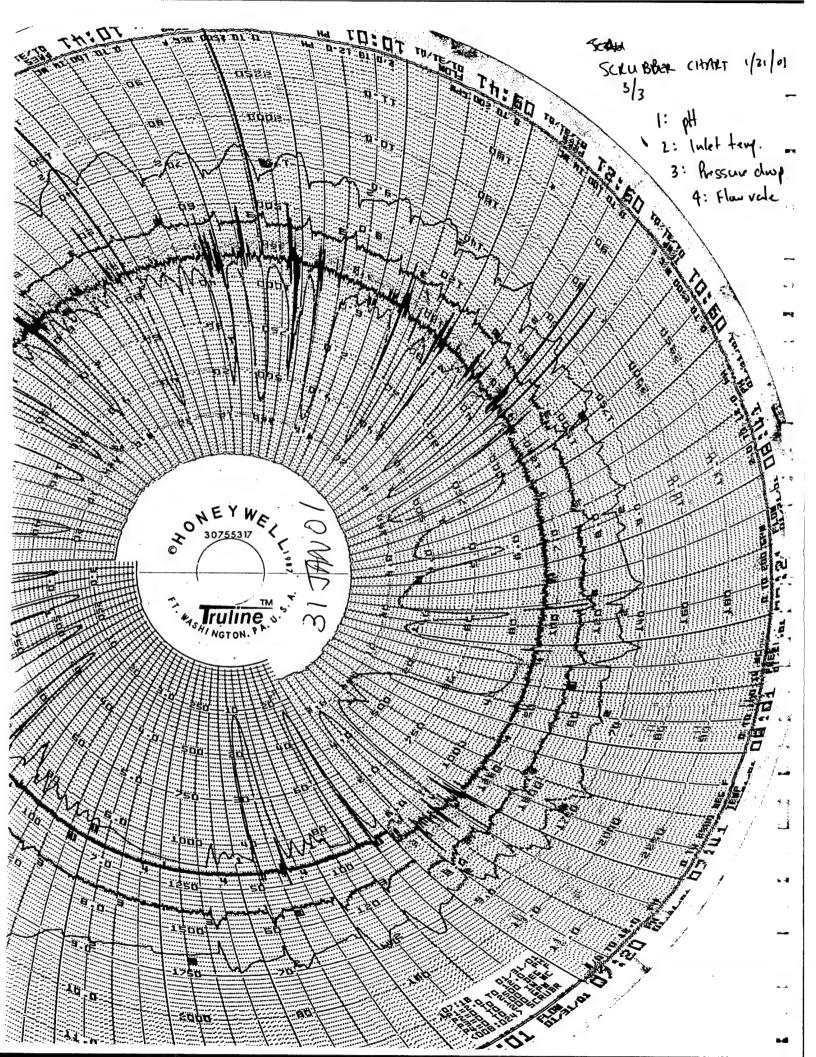
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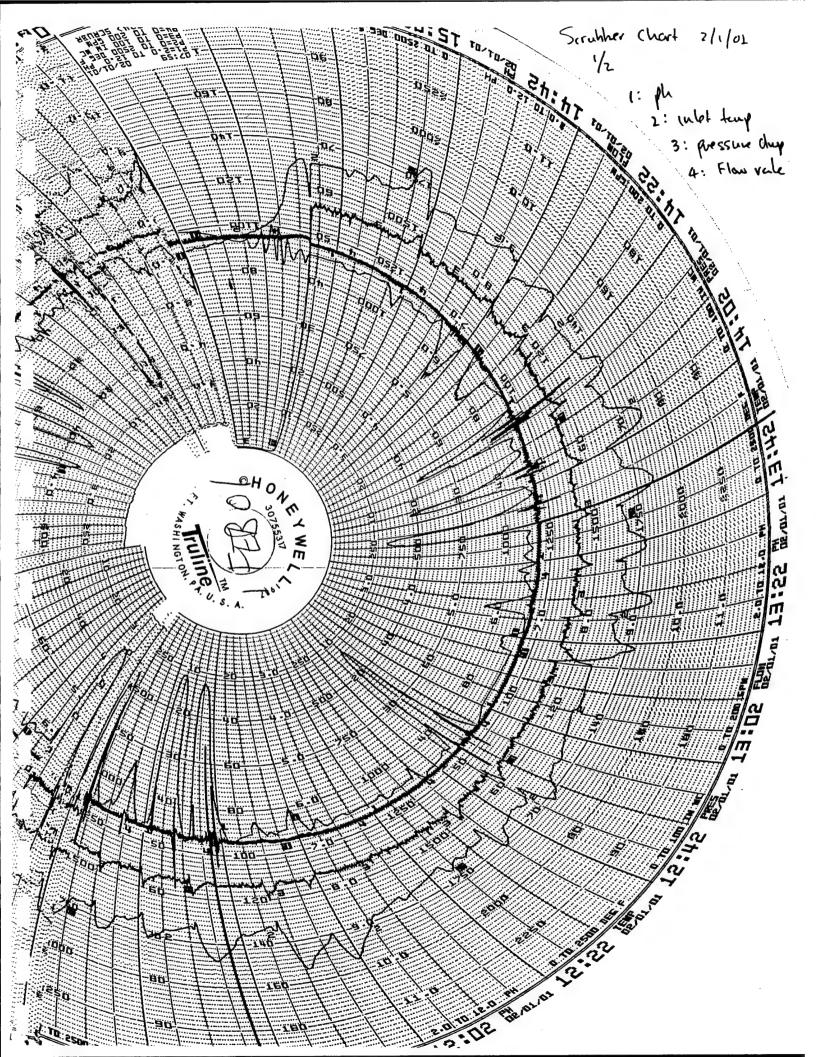
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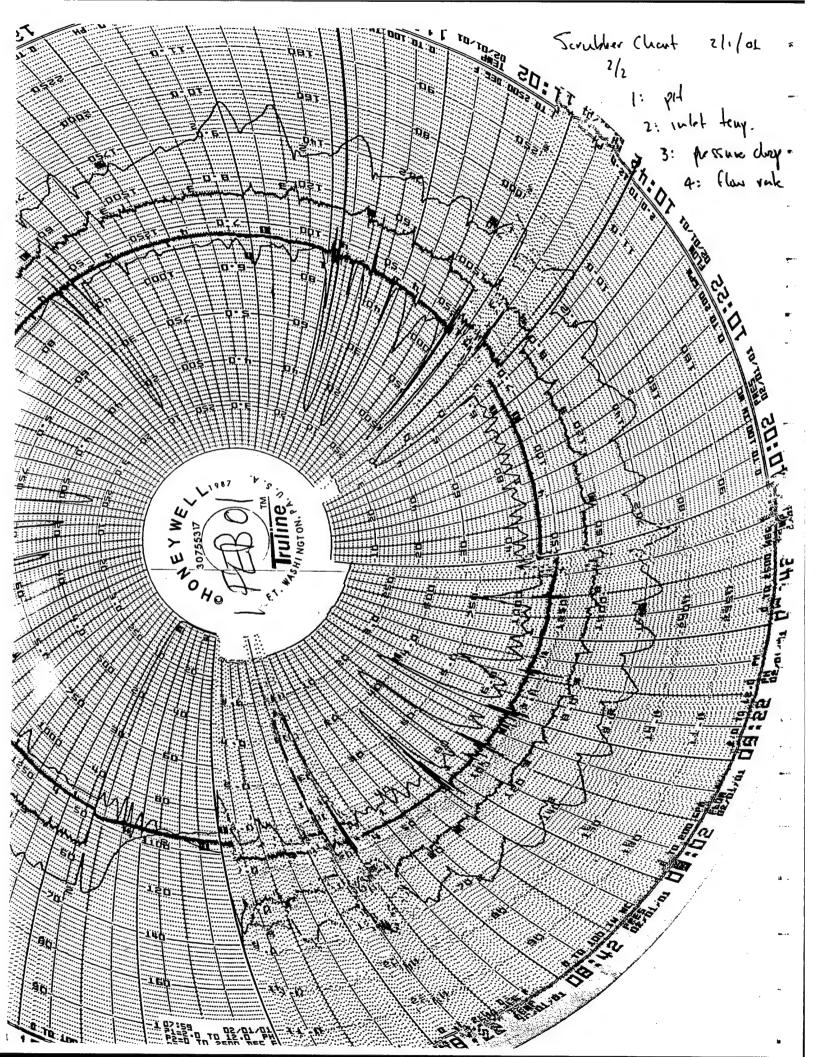
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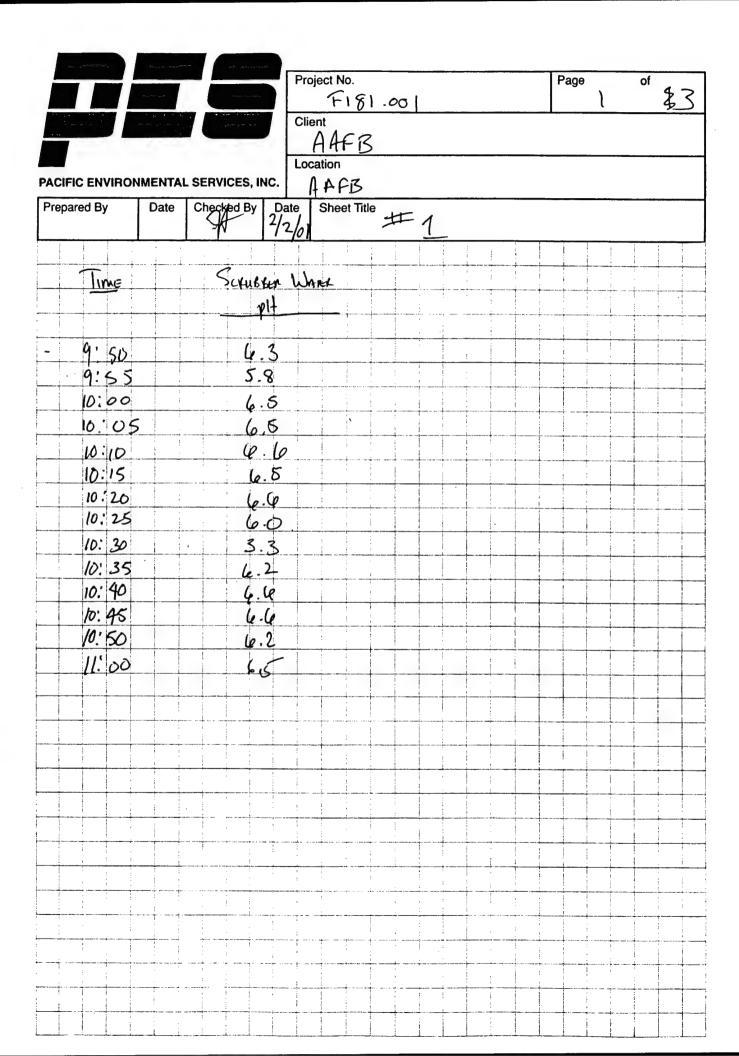


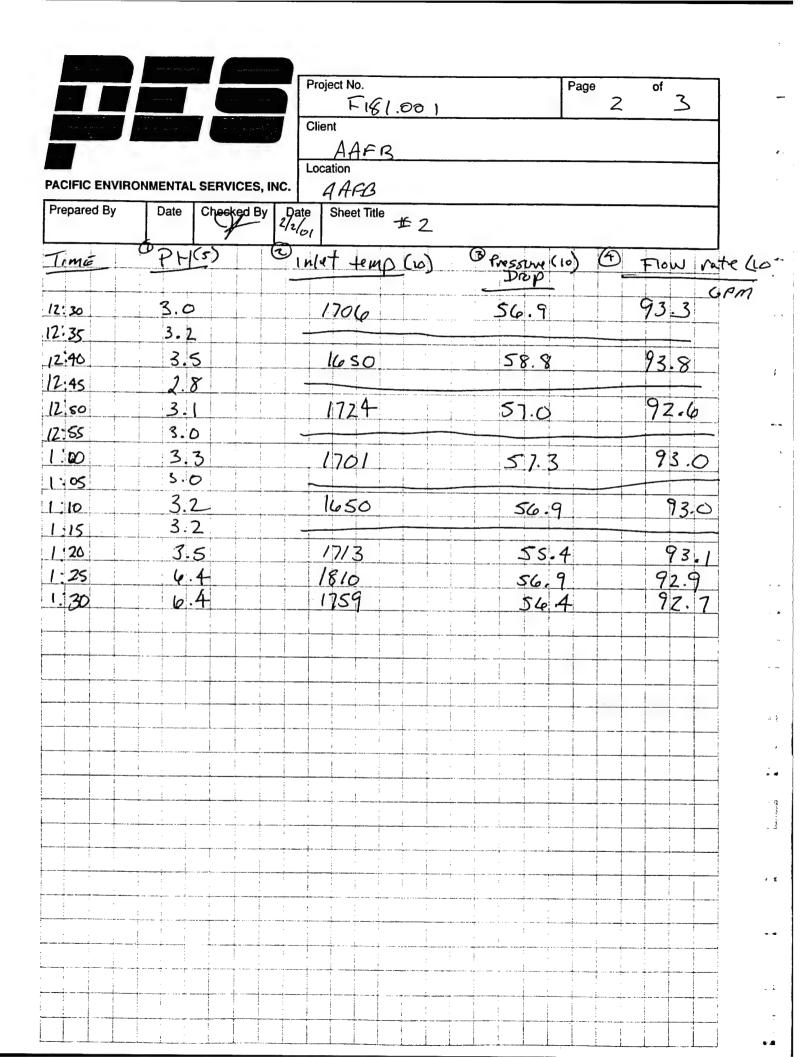












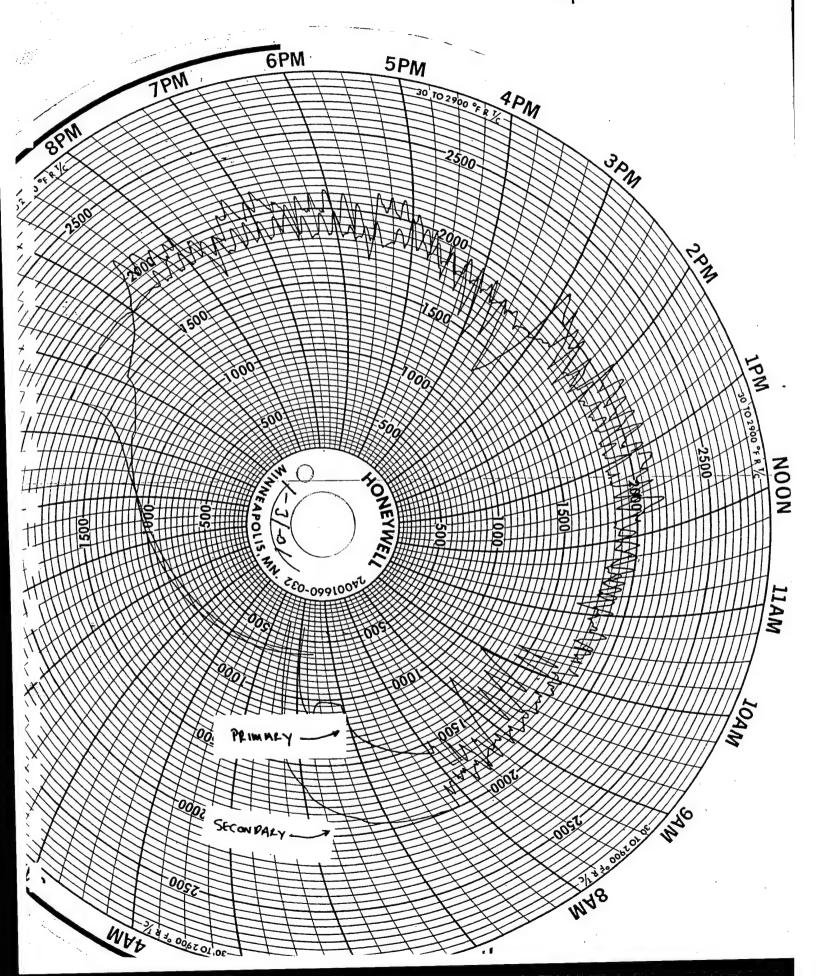


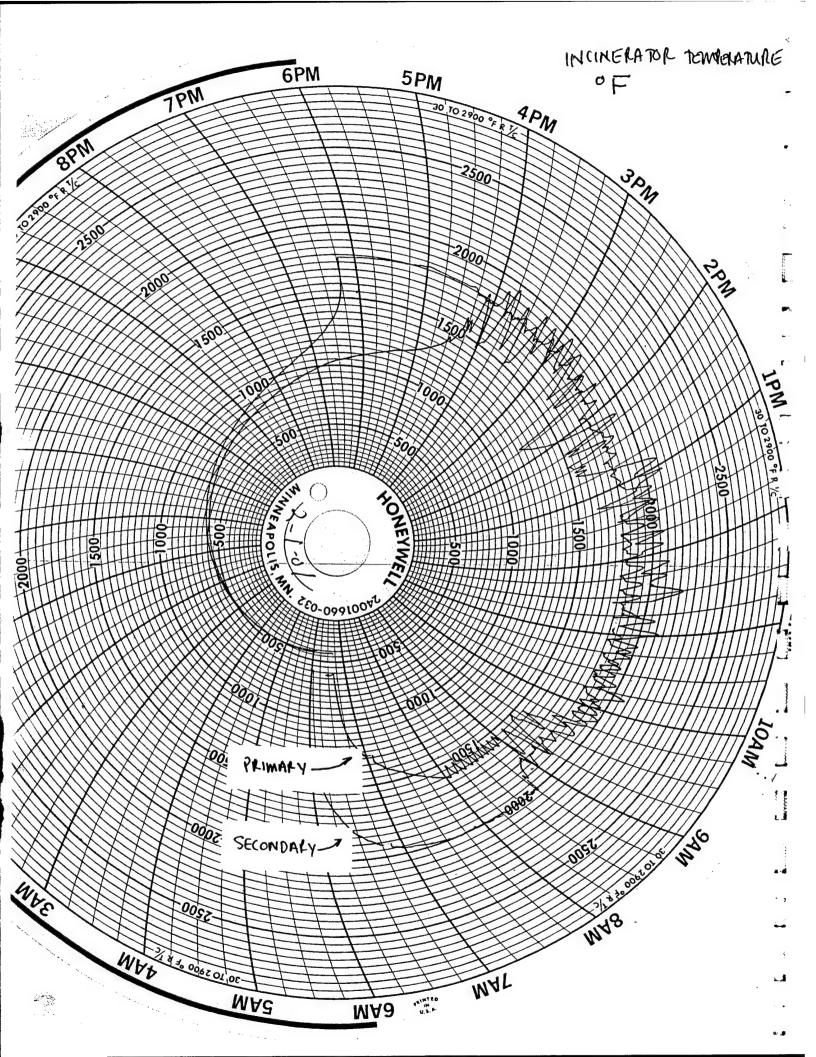
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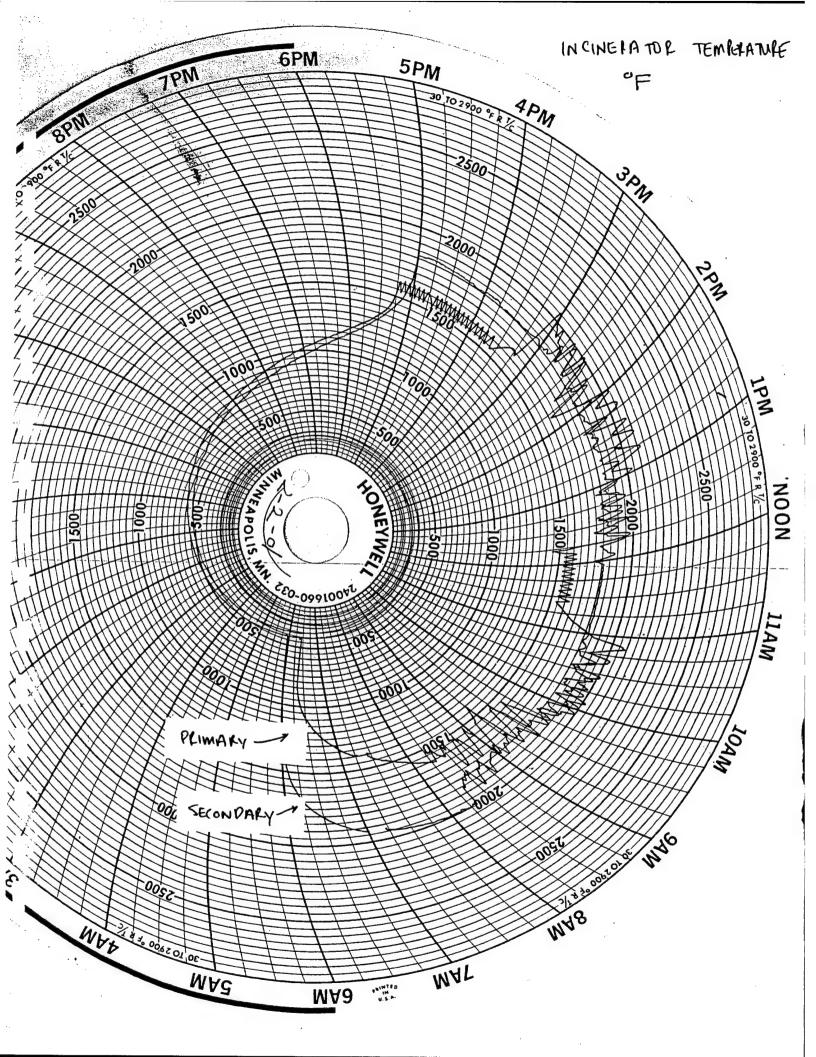
PACIFIC ENVIRONMENTAL SERVICES, INC.

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APPENDIX B RAW FIELD DATA

Appendix B.1 Raw Field Data Particulate Matter/Metals (M29)



TRAVERSE POINT LOCATION FOR CIRCULAR DUCTS

Plant: Andrews AFB	_	1	I
Date: 01-31-01	T		
Sampling Location: steek	55"		
Inside of Far Wall to Outside of Nipple:			
Inside of Near Wall to Outside of Nipple (Nipple Length): 3" Stack I.D.: 15 8	シロケ	©	ב
Distance Downstream from Flow Disturbance (Distance B):			
	60		
Distance Upstream from Flow Disturbance (Distance A):		·	
Calculated By: Dennis D. Holzschuh	1	Schemat Sampling L	

Traverse	Fraction	Length	Product of	Nipple	Traverse Point
Point	of	(inches)	Columns 2 & 3	Length	Location
Number	Length		(To nearest 1/8")	(inches)	(Sum of Col. 4 & 5)
A /	.044	1538"	5011	3	7) 25811633
3	146	1538"	24"!	ə	44" 54"
3	. 296	15 18"	45"	4	6 3" 75
4	. 704	153	10 38"	J	13 7 13 8
5	. 854	15 8"	138"	٦	15 3 168
6	. 956	153811	430	ગ્ર	16 3" 17%



Central Park West 5001 South Miami Boulevard, P.O. Box 12077 Research Triangle Park, North Carolina 27709 (919) 941-0333 FAX: (919) 941-0234

YAW ANGLE CHECK (EPA Method 1) & GAS VELOCITY (EPA Method 2)

Facility: Andrews Air Force Ruse	Project No.: F181-001
Sampling Location: Stock	Date: 01/31/01
Run # ₩2 -\	Clock Time: 0815-0830
Barometric Pressure, (in. Hg): 29.9	Operators: DDH
Moisture, (%): 35 %	Static Pressure, in H ₂ O: + iS
Dry Molecular weight, (g/g-mol):	Pitot Tube, Cp:84/
Stack Diameter or Side 1 Dimension, (in.): 153	Side 2:

Velocity Head In. H₂O •3.5 .3.6 .3.2 .43 .43 .45 .35 .40 .49 .48 .40	Stack Temp (°F) 170 170 170 170 170 170 170 17
1n. H ₂ 0 •35 •36 •32 •43 •45 •35 •40 •49 •48	(°F) 170 170 170 170 170 170 170 170 170 170
•35 •36 •32 •43 •44 •45 •42 •44 •49	170 170 170 170 170 171 170 170 170
.36 .32 .43 .44 .45 .35 .42 .44 .49	170 170 170 170 171 170 170 170
.36 .32 .43 .44 .45 .35 .42 .44 .49	170 170 170 170 171 170 170 170
.32 .43 .44 .45 .35 .42 .44 .49	170 170 171 171 170 170 170
.43 .44 .45 .35 .42 .44 .49	170 170 171 170 170 170 170
.45 .35 .40 .44 .49	170 171 170 170 170 170
.45 .35 .42 .44 .49	171 170 170 170 170
.35 .40 .44 .49	171 170 170 170 170
.42 .44 .49	170 170 170
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FIELD DATA SHEET

Sampling Location Street

Run Number: NJG-1 Date: D2-03-01

Pretest Leak Rate: 001 cfm @ 15 in. Hg.

Pretest Leak Check: Pitot: 0013at: N/A

Sample Type: N.24 Operator: DDK
Pbar: JA.94 Ps: 4.15
CO2: 5 O2: 13
Probe Length/Type: 3'-6125 Pitot #: 9.8-4
Stack Diameter: 15.20

Nozzle ID: 31〇 Thermocouple #: 紀七人 Assumed Bws: <u>い</u> Filter #: 10公 - 00 2 Meter Box #: 4wg-15 Y: 0.9公ら ΔH@: 1.8○ Post-Test Leak Rate: D.∞(cfm @ 15in. Hg. Post-Test Leak Check: Pitot: 人 Orsat: 244

Traverse	Semolina	Traverse Semoling Cook Time	Can Halas	Mathematical									
1		-	Tellar maio	Verocity	Cince Hessu	Critice Hessure Differential	Stack	Temp	Temperature	Impinger	Dry Gas M	Dry Gas Meter Temp.	Pump
		(24-hour	Reading	(d∇) peeH	(HQ)	(AH) in H2O	Temp.	0	9.	Temp.	Flet	Outer	Vacuum
Manage	(UE)	300	Vm) #3	h H20	Desired	Actual	(Js)	Probe	Filter	9	(Tm in P)	(Tm out ^o F)	5
T A	q	045	805,550										
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4	/5	000/	817.210	45	02.1	1.70	173	283	281	78	00,	00/	~
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જ	35	850)	831.840	.35	1.75	1.75	121	454	252	49	70		1
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MULTI-METALS SAMPLE RECOVERY DATA

						DPACETIC ENVIRONMENTAL BERVICES, INC
Plant: ANN	ous AFB MND				Run N	10.: M79-L
Date: 02/	07/01	Sample Box N	10.:			0.: F181_CUL
Sample Loca	ation: We were to	- Outlet				
Sample Type	e: WZ9					
Sample Rec	overy Person: W	NIM				
Container	Description			Volume,	ml Seal	ed/Level Marked
Front Half						CULEVELIVIAIRED
1	Filter No.(s)	4.007			The state of the s	
2	Acetone Rinse					
3	Nitric Rinse		,			
Back Half						
4	Nitric Rinse - Imp.				5, 158.5	essential the literal parameter (Astuate the Mo
5A	Nitric Rinse - Impin					
5B	KMNO4/H2O Rinse		& 6			
5C	HCI Rinse - Imping	ers 5 & 6	,			
Moisture Da	ta					
Impinger	Contents	Initial		V	Veight, gr	ams
No.		Volume, ml	lni	tial	Final	Net
1	Y.O.	0	616	8.8	878. 1	711.3
2	14203	lw	751	.1	355.6	(03.9
3	14003	lω	G 34		658.1	24.0
4	TM	0	629.		633.2	3. 6
5	KMnC4	lw	728		30.B	2.3
6	KMnC4	IW	721.		721.9	0.8
7	Su Gel	-	913.	1 (222. 1	9
Total						3000
Comments:					"	354.9

FIELD DATA SHEET

Sampling Location Steeler Cost of the Run Number: Cost of the Cost

 Sample Type:
 Νλ3ς
 Operator:
 DD&L

 Pbar:
 25.5c
 Ps:
 + . 1 q

 CO2:
 .
 .
 .

 CD2:
 .
 .
 .

 Probe Length/Type:
 3' - (-bss/Pitot #: RQ-ις Reported to the state of

Nozzle ID: 310 Thermocouple #: RT-C. Assumed Bws: 52 Filter #: 108-02 & Meter Box #: AMB-ISY: 945 AH@: 1.20 Post-Test Leak Rate: 0.00, cfm @ 15 in. Hg. Post-Test Leak Check: Pitot: 1001

			1.3				X = 5.0	0					
Traverse	Sempling	Traverse Sampling Gock Time	Gas Meter	Velocity	Orifice Pressu	Orifice Pressure Differential	Stack	Temp	Temperature	Impinger	Dry Gas M	Dry Gas Meter Temo	Pumo
<u>F</u>	Ĕ	(24-hour	Reading	Head (Ap)	(HQ)	(AH) in H2O	Temp.	-	0 F	Temp.	hiet	Oute	Vecuum
P P		gock	(Vm) ft 3	h H2O	Desired	Actual	(s)	Probe	Filter	4	Cla In P.	Cm out P.	5
A	Q	1230	849.500										
4	8	/335	852.210	. 34	1.70	1.30	173	050	150	49	104	10%	1
3	0/	1240	855.900	. 35	1.75	1.75	G L J	253	155	50	104	10%	1
4	/5	5421	854.480	. 35	1.75	1.75	171	250	25.1	SCO	104	401	0
5	20	1350	863.030	.33	1.65	1.65	172	253	751	50	104	201	1
9	95	1355	812.0.018	.36	1.80	08.1	122	95a	35(20	10%	100	
4	30/0	1300	870.200	.36	1.80	7.80	(1)	252	185	15	707	20	n
`	35	1310	873.961	ß	1.75	7.75	171	250	252	52	10%	10	1
7	07	1315	877.300	35	1.75	1.75	121	252	156	12	104	104	
4	45	1320	880.750	گ د.	07:	1.40	121	252	152	52	707	103	1
5	20	1325	884.010	800	1,40	1.40	27	253	250	Sp	100	(0.3	
٥	55	1330	887.720	. 34	1.70	1.70	173	232	150	50	70	4	1 0
	(80	1335	891.530	. 37	1.85	1.85	aci	28.	250	0	2	13	3
				٠							3	2	1
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MULTI-METALS SAMPLE RECOVERY DATA

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	WKOUS ATTS W	V			Run No	: M79-2
Date: 02	la lost	Sample Box N	lo.:		Job No.	: F181 .au
Sample Loc	ation: Incharter	Outlet				
Sample Typ	e: Wethod 29					
Sample Rec	covery Person: \	NM				
Container	Description		Vol	lume, ml	Sealed	I/Level Marke
Front Half					Comments Ann	"LOVE MAINE
1	Filter No.(s)	04-003			ericani este este esta esta esta esta esta esta	estal de la session de la filipa
2	Acetone Rinse					
3	Nitric Rinse					
Back Half				and the Control of th		
4	Nitric Rinse - Imp.	1,2,3, + Back 1/	2 Filter			en en merke en ekselytigen til et klikiskings en fle
5A	Nitric Rinse - Impir	nger No. 4				
5B	KMNO4/H2O Rins	e - Impingers 5	& 6			
5C	HCI Rinse - Imping	ers 5 & 6				
Moisture Da	ita:	Contraction				#Microscopic Control
Impinger	Contents	Initial		Weig	ht, gran	ns
		\/olumna	1-14:-1		no!	
No.	× 0	Volume, ml	Initial	Fi		Net
ľ	K-0	0	643.2	776	.5	133.3
2	14403	0 (w	643.2	773.0	878.6	133.3 115.6
3	14NO3	0 (w	643.2 621.8 759.5	776	878.6 7	133.3 115.6 57.2
2	14NO3 14NOS UMT	0 (w (w)	643.2 621.8 759.5 523.8	7713.0 1 816.	878.6 7	133.3 115.6 57.2 12.3
2 3 4	14NU3 14NUS UMT KMNO4	0 (w) (w) 0	643.2 621.8 759.5 523.8 760.6	776 713.0 816. 536. 768.	878.6 7	133.3 115.6 57.2 12.3 8.1
2 3 4 4	14NU3 14NUS MT KMNO4	0 (w (w)	643.2 621.8 759.5 523.8 760.6 737.8	776. 713.0 816. 536. 768. 734.	878.6 7 1	133.3 115.6 57.2 12.3 8.1 1-3
2 3 4	14NU3 14NUS UMT KMNO4	0 1w 1w 0 1w	643.2 621.8 759.5 523.8 760.6	776 713.0 816. 536. 768.	878.6 7 1	133.3 115.6 57.2 12.3 8.1
2 3 4 4	14NU3 14NUS MT KMNO4	0 1w 1w 0 1w	643.2 621.8 759.5 523.8 760.6 737.8	776. 713.0 816. 536. 768. 734.	878.6 7 1	133.3 115.6 57.2 12.3 8.1 1-3
2 3 4 4	14NU3 14NUS MT KMNO4	0 1w 1w 0 1w	643.2 621.8 759.5 523.8 760.6 737.8	776. 713.0 816. 536. 768. 734.	878.6 7 1	133.3 115.6 57.2 12.3 8.1 1-3
2 3 4 4	14NU3 14NUS MT KMNO4	0 1w 1w 0 1w	643.2 621.8 759.5 523.8 760.6 737.8	776. 713.0 816. 536. 768. 734.	878.6 7 1	133.3 115.6 57.2 12.3 8.1 1-3

FIELD DATA SHEET

Sampling Location Stock

Run Number: MAR-3 Date: 03-02-01

Pretest Leak Rate: 603 cfm @ 15 in. Hg.

Pretest Leak Check: Pitot: //A

| Operator: | | | Operator: | | Operator: | | Operator: | | Operator: | | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Operator: | Ope

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0 000	100	4		4	0.000								1
R	Burdin	Sample Cock into	Gas Meler	Velocity	Orlice Pressure Differential	ire Differential	Stack	Temp	Temperature	Imminoses	L		
	- E	(24-hour	Reading	Head (Ap)	1 (HV)	(AH) in H20	Temp.		96	Territoria		Lity that Meter Temp.	d :
Number	(min)	clock)	(Vm) R3	h H20	Desired	Actual	(Js)	Probe	Filher	9	Tales	200	Vacuum
A 1	٥	1405	891.600						Milli		(Imm r)	(I'm out'F)	F. Hg)
~	S	1410	854. 800	30	.50	180	25	350	15.	1	11111		7777
7	Ø	1415	899.150	. 36.	0	0	1		100	70	10/	10/	d
*	15	1420	903.860	3.5	1.75	٠٠٠ ا	17	252	7	57	103	701	7
2	20	1425	907.640	3.5	1.75	75	17.00	20.2	250	57	103	(00)	M
9	25	1430	911.305	48	170	200		252	60	77	50	601	M
7	30/0	1435	915.160	. 34	0,1	0 1		CV	150	48	10%	601	M
7	35	1445	918.650	. 35	75.	7	(;	Т	000	40	ð.	(0)	M
3 9	40	1450	922.322	.35	7.	1	9	T	5	70	10%	(03	4
84 H	5	_	936. 617	8	000	2	12/	050	250	53	103	/03	3
		+-	0 00 00	20	1:10	ر.بره	173	254	150	15	103	501	~7
+	2	- 1	701.77	.37	1.85	7. gs	173	253	252	5.5	104	201	~
55	N	505	934.000	. 34	1.70	07.1	401	252	150	i	70	7 .	1
09	0	0161	938.050	34	1.70	1.70	27.0	, 30	, iv	1		^ 0	7
							8	2	6	8	707	/0/	2
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MULTI-METALS SAMPLE RECOVERY DATA

Plant: ANY	news AFB				Run No	: M29-3
Date:		Sample Box N	No.:		Job No.:	
Sample Loca	ation:				000 110.	
Sample Type	e:					
Sample Rec	overy Person:					
Container	Description			Volume ml	Sealed	/Level Marked
Front Half		•	- Springers new		Calcu	/Level Market
1	Filter No.(s)	104-005		Control of the Contro	The man The Section (Section)	
2	Acetone Rinse					
3	Nitric Rinse					
Back Half						
4	Nitric Rinse - Imp.	1,2,3, + Back 1	/2 Filter			A TO SECTION OF THE S
5A	Nitric Rinse - Impi					
5B	KMNO4/H2O Rins	e - Impingers 5	& 6	·		
5C	HCI Rinse - Imping	jers 5 & 6				
Moisture:Da	tax					
Impinger	Contents	Initial		Wei	ght, gran	ns
No.		Volume, ml	Init		inal	Net
2	k.o.	0	619.		3.0	103.6
	HNO3	100	747		8.4	111.2
3	HNO3	lw	638			74.9
4	Y.a	0	630.7			70.9
5	KWh-O4	ιω	779.5			18.6
6	K.Wh. O4	lu	719.1			6.3
7	S. Gel	-	Q22.V	947.	9	70.9
Total						356.4
Comments:						330-1

Appendix B.2
Raw Field Data
Dioxins/Furans (M23)



Research Triangle Park, North Carolina 27709 (919) 941-0333 FAX: (919) 941-0234 Central Park Ives 5001 South Miami Boulevard, P.O. Box 12077

US EPA M23 FIELD DATA SHEET

Orsat: Pretest Leak Rate: 200 cfm @ 151 in. Hg Date: 01/31 Sampling Location: Stock BEB Run Number: 1-5-1 Plant: Andrews

Probe Length/Type: 3' 6625 Pitot #: RP-19 Sample Type: _____ Operator(s): ____ 185,78 100 Ps: + .15 Stack Diameter: 1538" As: _ .. 0 Pbar: 29.90 500

Posttest Leak Check Rate: Pitot: 12-24 Orsat: Nozzle ID: XXIV - - 3/5/Thermocouple No.: ATC. Meter Box No.: RAB-15 7: 1945 AH@: 1-80 Assumed Bws: ~35% Filter No.: ひを

	1						×	7.886	(B4.745	145				٠
Sampling Clock G. Time Time F (24-hr)		<u>о</u> п.	Gas Meter Reading	Velocity Head	Orifice F Differ (∆H, ir	rifice Pressure. Differential (∆H, in H₂O)	Stack Temp	Probe Temp	Filter Temp	Impinger Temp	XAD Temp	Dry Ga Temp	Dry Gas Meter Temperature (*F)	Pump
	-			() () () ()	Desired	Actual						Inlet	Outlet	(in. Hg)
0 102C 33		3	320.090											
5 1031 23		5	235.850	45.	1,43	1.43	071	250	250	8/7	86	4	15	2
0501 01		J	₩C.98€	-35	1.47	1.47	170	247	150	48	No.	88	24	N
1801 31		3	743.5ch	, 34	1.43	1.43	170	248	250	44	44	80	00	M
3010 1046 =		'1	246.133	.35	147	1.47	071	249	251	48	4.9	88	88	~
		7	145.564	. 35	1.47	147	170	242	282	50	2(& &	/XI	M
			253.010	.30	1.5.1	1.51	170	750	250	\$0	ST	Q1 A0	æ	~
1101		- 4	255 5ch	.36	1.51	1.5.1	170	231	3	51	51	200	20 00	M
2011 0/04		_	258.900	.39	1.004	1.04	170	252	250	48	80	Co Co	00	~
1111 54	\neg		261.815	.33	1.34	1.34	וכו	150	150	49	49	හ	00	~
50 11 16			265,200	.35	147	1.47	121	250	150	49	54	60	d	N
1511 25			OS0.800	.36	1.51	1.51	121	252	75/	44	a	Q A	36	M
60/0 1126	\neg		272000	36	1.5.1	181	121	252	254	2(51	80	00	~
1131			275.343	36	1/2/	1.51	121	252	251	52	5/	8 8	8	~
1136			278.400	'n.	1.55	121	121	150	553	Į.	51	80	ø.	M
1411 52	141		982.400	८ हे	1.55	1.55	121	252	354	74	50	8	000	N
1416			000 ogg	.36	1.5.1	1.51	121	252	253	5(15	90	000	M
11511		·u	290.043	.360)5')	1.5.1	121	283	186	\$(3 (8	8	1
1186		N	394.000	35	1.72	4.73	121	25.2	251	1 4	/5	200	88	4
1001			248 000	7%.	1.02	583 ·	121	253	150	2 (15	00	68	~
906,			304.165	36	1.63	1.63	121	152	150	5.2	2,4	88	00	~
1211			305.675	¥	1.54	1.54	121	757	787	3 (21	00	00	مو
110 1016 3		MI	30A.000	.33	1.49	1:45	201	گر	150	121	53	88		the state of the s
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Page / of 3 Pages

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Central Park West 5001 South Miami Boulevard, P.O. Box 12077 Research Triangle Park, North Carolina 27709 (919) 941-0333 FAX: (919) 941-0234

US EPA M23 FIELD DATA SHEET

Plant: Archeus AFG.
Sampling Location: Stack
Run Number: AS-1 Date: Olsst. Hg
Pretest Leak Rate: O.O.O. cfm @ 15 in. Hg
Pretest Leak Check: Pitot: AA

Nozzle ID: 310 Thermocouple No.: RTLA Assumed Bws: ~32 Filter No.: D F Meter Box No.: RMB-57: 0.845 AH@: 480 Posttest Leak Rate: 0-510 cfm @ 13 in. Hg Posttest Leak Check Rate: Pitot: Corsat: ピカ

		300	इज्ञाह																				
Pump Vacuum	(B))	7	2	^	7	7	7	~	7	2	7	7	7	7	_	7	7	7	7	77	7	7	۲
s Meter rature 7)	Outlet	20	80	4	90	90	30	90	91	90	11	91	42	52	\$ 2	48	93	50	92	43	43	93	80
Dry Gas Meter Temperature (°F)	Inlet	88	88	Q	16	90	90	15	91	90	10	93	92	93	4.3	93	93	93	93	93	43	42	32
XAD Temp	(;)	50	50	20	50	15	15	52	55	2/	S.	52	52	5.5	52	'n	Sa	5	, 6	જ	53	15	25
Impinger Temp		50	21	52	51	5.2	7,5	52	55	15	21	52	53	53	27	4	502	S	50	5.2	52	51	5.2
Filter Temp		 750	253	254	251	250	754	250	25	450	∂ 8⁄	351	250	18	156	251	250	121	253	120	252	750	246
Probe Temp		781	25.2	452	150	253	253	353	>54	254 ·	756	252	253	153	454	727	553	950	650	252	25.5	252	250
Stack Temp	5	280	121	121	173	621	121	172	ادح/	173	173	173	123	671	120	172	121	/2/	1 ()	121	172	721	172
Orifice Pressure Differential · (ΔH, in H ₂ O)	Actual	18.7	96.1	1.41	1.45	1.64	1.27	£8.7	78·/	1.45	1.51	1.59	1.041	1.59	1.59	1.55	1.5%	1.60	1.65	091	·.	1.65	1.65
Orifice F Differ (∆H, ir	Desired	1.8.1	34.1	14.1	1.45	1.64	1.22	68./	1.83	1.45	1.59	1.55	1.64	1.59	1.59	1.55	1.56	1.60	1.65	09.1	1.60	1,65	165
Velocity Head	(∆r, in ri₂O)	40	.34	15.	65.	.36	39	04.	.40	.32	.35	35	36	.35	35	34	,34	.35	136	. 35	.35	98.	. 36
Gas Meter Reading	(Vm, ff.)	3/3.042	37.480	325.730	376.340	329.595	333.450	337,453	240.980	343.453	142.341	351.078	354.456	357.950	361.30	364,500	368.340	373.042	375.786	379.453	382.900	386.100	3399.560
Clock	(24-hr)	1771	١,			16		.,	Т	T						1355					1490	1435	
Sampling	(min)		2007	105	0		140	54,	180	155	160	16.5		175	50	28/	960	145	200	305	016	2/6	
Traverse Point	Number		4				7				2				7				un.				3

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Page 2 of 3 Pages



US EPA M23 FIELD DATA SHEET

5001 South Miami Boulevard, P.O. Box 12077 Research Triangle Park, North Carolina 27709 (919) 941-0333 FAX: (919) 941-0234

Cr. ' | Par' ' 'st

Plant: איייי איייי איייי איייי איייי איייי איייי איייי אייייי איייי ייי איי

Nozzle ID: 3 (C) Thermocouple No.: 9T-C.
Assumed Bws: 3 Eilter No.: 2 F

Meter Box No.: 2 F Filter No.: 2 F

Meter Box No.: 2 A Filter No.: 2 F

Posttest Leak Rate: 2 on 2 Cfm 2 Cfm 4 Cfm 1 Cfm 2 Cf

								K=4.75	25.5					
Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head		Orifice Pressure Differential (AH, in H ₂ O)	Stack Temp	Probe Temp	Filter Temp	Impinger Temp	XAD Temp	Dry Ga Tempe	Dry Gas Meter Temperature (°F)	Pump
	-		(a. iw.)	(~7	Desired	Actual		Ē	E .		<u>.</u>	Inlet	Outlet	(in. Hg)
			018.545											
	225	1935	H4.000	.36	1,005	100	47.2	251	248	48	48	NO	40	1
	230	0,60	392.740	. 36	7.06	1,605	121	252	340	48	54	N	6	ı
	035	1945	401.342	. 33	(,5)	151	1 < 1	150	787	7.5	3 %	2		1
	240	1850	405.61	.34	1.56	1.56	172	250	250	3%	8%	4	0	1
												2	1	
							•							
							-							
							-							
		-	_									1	-	

Page 3 of 3 Pages

ΔH:

Δp:

 ΔV_{m}



Central Park West 5001 South Miami Boulevard, P.O. Box 12077 Research Triangle Park, North Carolina 27709 (919) 941-0333 FAX: (919) 941-0234

Sample Train Recovery Data EPA Method 23

Date: 1 30 01		Run No.:	<u></u>						
		Sampling Location: 12	waretr Outlet						
Field Team Leader: _	MN)M	Samplers: PA V)0	H, JF, MDM						
Comments:									
Filter No.: un-underd):						
Filter No.:	Filter Media:	Tate Wt (mg):						
	David II	WD 4							
	Back-H	alf Data	-						
•		Knock-out Impinger	Impinger No. 1						
Contents:	XAD-2 Sorbent Resin	, TM 14	100 ml HPLC H₂O						
Final mass (g):	326.5		583.2						
Initial mass (g):	308.8	495.7	584.3						
Net Mass (g)	17.7	795.8	(1.1)						
	Impinger No. 2	Impinger No. 3	Impinger No. 4						
Contonto									
Net Mass (g)		7.6	USIT						
tal Moisture Collected: (g): 1,390.2								
escription of Impinger Ca	tch: F 800.7	t F 787	1.1						
Dankers #2+ 461.		Nu 4 I 461	-2						
Net. 380.		375	.9						

MANUEL SERVICES, INC.

US EPA M23 FIELD DATA SHEET

Sample Type: トゥン Operator(s): トゥント Pber: こうちら Ps: ナ・1 ら CO2: こう CO2: こう CO2: こう CO2: こう CO2: こう CO2: スターパ Stack Diameter: 15 元 As: 18 5・スターパ

Nozzle ID:スマル・3 io Thermocouple No.: <u>Q.T.C.</u>
Assumed Bws: こままままます。 System Box No.: <u>& Me ら</u>で: <u>System Box No.: & Me ら</u>で of m @ <u>As</u> in. Hg Posttest Leak Rate: <u>o. e.o.g.</u> cfm @ <u>As</u> in. Hg Posttest Leak Check Rate: Pitot: <u>+ 3</u> Orsat: AA

Dry Gas Meter
i
Orifice Pressure

Pump Vacuum	(BL .iii)		9	9	7)	ل ا	3	9	ی	9	و	و	2	6	\$	9	6	6	2	ی	0	v	7	,
s Meter rature =)	Outlet		48	30	89	. 5 &	(00)	100	(00)	100	401	(0)	100	101	407	100	1001	107	401	104	401	\$2/	103	301
Dry Gas Meter Temperature (°F)	Inlet		3%	83	58	50	400	1001	101	103	102	100	103	164	100	103	E 0/	103	108	901	108	801	891	801
XAD	()		47	47	97	イン	48	48	84	50	50	15	52	20	15	50	12	128	51	50	22	53	0 k	51
Impinger Temp	()		49	49	44	44	24	48	49	50	50	5	52	5	5.2	5/	5/	50	5 (52	50	53	50	21
Filter Temp	()		150	250	150	150	35	251	181	251	150	252	250	250	150	150	252	190	251	150	351	Ē	950	250
Probe Temp	()		254	95¢	030	250	253	253	252	252	250	253	550	757	45c	253	25 3	25.5	252	250	250	950	150	252
Stack Temp			10,	121	121	121	661	172	461	172	(72	172	123	52	172	(73	(22	173	173	173	123	1231	173	172
Orifice Pressure Differential (∆H, in H₂O)	Actual		1:63	و	1.5.1	1.56	10/21	1.20	1.56	1.61	1.00	797	1.101	1.61	7.6	lital	1.70	Litela	1,90	1.64	25.	10.0	0.01	1.96
Orifice Pr Differei (∆H, in I	Desired		1.63	19.	1.6	1.61	1.61	02.1	1.56	1.61	.6	1.00	1.61	101	1.61	1.50/	1.20	1.66	1.40	1.64	1.90	2.01	2.01	1.76
Velocity Head	(25, 111, 120)		1361	.34	78	. 34	.3M	. 36	. 33	.34	. 34	. 35	.34	*	. 34	.34	. 36	.35	.35	.30	3E ·	.37	.37	.36
Gas Meter Reading	(Am, 11.)	400.115	410,102	414.101	418.109	421.096	09HKCh	423,250	431.325	434.250	438.40	141.009	445 300	449.017	45 S. 240	457.140	460.690	464.250	UC8.876	473.171	476.410	480.130	484.140	487.703
Clock Time	(24-111)	0191	51011	_			5491	_		7200	5051					1740	1745	1750	1755	1800	1805	1810	18/5	180
Sampling Time	ÎIIII	۵	1	01	15	20	25	30	35	C/2	5.5	50	55	09	36	8	75	8	25	30	55	001	105	011
Traverse Point	lagilina.	1 4				~				٤				17				5				و	-	

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Central Park West 5001 South Miami Boulevard, P.O. Box 12077 Research Triangle Park, North Carolina 27709 (919) 941-0333 FAX: (919) 941-0234

US EPA M23 FIELD DATA SHEET

Plant: Andraws NF.C.
Sampling Location: Str. K.
Run Number: Str. K.
Run Number: Str. K.
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Run Number: Str. K.
Run Number: Str. K

Sample Type: A&3 Operator(s): DAA

Par: 24.4 Ps: t.v5

CO2: 5 O2: 18

Probe Length/Type: 3'-6455 Pitot #: 89-19

Stack Diameter: 15 3'8 As: 185.78

Nozzle ID: 5xxt -. \$10Thermocouple No.: 27-C.
Assumed Bws: 3.2. Filter No.: Dr.
Meter Box No.: 2xx Filter No.: Dr.
Meter Box No.: 2xx Filter No.: Dr.
Posttest Leak Rate: 2.010 cfm @ 15 in. Hg
Posttest Leak Check Rate: Pitot: 14

	Pump Vacuum	(III. mg)		1	7	7	7	2	7	ι	7	7	1	۲	~	~	7	7	7	7	W.	Q	8	10	B
	Meter rature)	Outlet		107	101	107	107	80%	80%	801	901	107	108	801	201	801	107	108	801	691	109	0//	110	us	101
	Dry Gas Meter Temperature (*F)	Inlet		801	801	108	108	801	(0)	101	107	107	401	108	108	89/	10B	801	601	501	109	101	109	101	104
	XAD Temp	()		45	45	45	46	46	42	47	47	47	47	47	48	47	47	48	48	34	48	48	4.9	6/5	79
Q	Impinger Temp	()		46	46	46	47	47	47	46	26	47	48	48	48	400	48	*8	48	48	48	48	48	48	48
V=5.80	Filter Temp (*F)			35	251	751	750	750	250	150	250	250	150	252	250	150	150	25.2	251	75/	252	350	750	150	150
15675	Probe Temp	Probe Temp (*F)		150	255	18.0	32.	2007	H	252	150	252	150	250	250	253	253	253	252	350	252	750	350	250	150
K= 5.456 75	Stack Temp			174	171	133	172	121	122	120	172	123	113	172	451	120	173	173	121	121	121	171	(1)	173	123
	ressure ential H ₂ O)	Actual		2.12	1.960	1.74	1.74	1.24	1.86	7.86	2.05	2.14	3.03	2.03	1.91	1.51	2.20	3.0€	3.20	1.79	1.79	1.50	7.50	7.50	1.56
	Orlfice Pressur Differential (∆H, in H₂O)	Desired		2.10	1.96	1.74	1.74	1.74	7	7.86	2.05	2.14	2.0.2	3.03	1.91	1.51	2.20	3.08	220	1.79	1.79	7.50	1.50	1.50	1.561
	Velocity Head	(51, 111, 120)			i.	38	.32	.32	.34	.34	.35	.37	.35.	. 35	.33	.33	.38	38	2	. 3/	, 31	.26	. 26	26	٠٤.
	Gas Meter Reading	(Au II)		OLD.184	495.550	489.430	50.910	506.400	510.150	54.000	518.100	521.900	5.26.217	524. 740	533,680	537.520	541.630	545.80>	549.510	553210	556.500	540.017	503:105	567.013	570.380
	Clock Time	(=+-111)		1825	1850	1880			1855		1905	01 64				19.30		3445	1950	1985	2000	2005	2010	2016	
	Sampling Time	(mmi)		115	120/0	125	1.50	135	140	145	251	58/	160	165	120	561	180	185	961	145	300	305	ale	215	ace
	Traverse Point	Muliper			10 E				3				3				7				5				*

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ΔVm:

PACIFIC ENVIRONMENTAL SERVICES, INC.

Central Park Misst 5001 South Mismi Boulevard, P.O. Box 12077 Research Triangle Park, North Carolina 27709 (919) 941-0333 FAX; (919) 941-0234

US EPA M23 FIELD DATA SHEET

Plant: Andrews AFB
Sampling Location: 子もん
Run Number: ANDRE: Otal 31 Pterest Leak Rate: との cfm @ 12 in. Hg
Pretest Leak Check: Pitot: イも "Orsat: A)A

		125.53			_	_	, _	 						 			
Pump Vacuum	(in. Hg)		10	3	0	2											
Meter rature)	Outlet		60/	301	801	201											
Dry Gas Meter Temperature (°F)	Inlet		501	301	501	603											
XAD Temp	()		48	48	49	44											T _m ;
Impinger Temp	()	7.	44	44	44	79											
Filter Temp	()		150	250	251	231							-				
Probe Temp	()	- 200	28.0	150	752	250											
Stack Temp			172	121	171	172		 	 	 		 		 	 	 -	
Orifice Pressure Differential (∆H, in H₂O)	Actual		1.74	1.74	1.79	1.29											
Orifice Pressur Differential (∆H, in H₂O)	Desired		44.1	1.74	1.79	1.79											ΔH:
Velocity Head	(21, 111, 12)		.30	30	.31	. 3.											0:
Gas Meter Reading			574.010	577.210	580.800	584.155											Δρ:
Clock Time	(=)	`	2025	2050													ΔV _m :
Sampling Time	(mm)		205	250	235	975											
Traverse Point																	

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Central Park West 5001 South Miami Boulevard, P.O. Box 12077 Research Triangle Park, North Carolina 27709 (919) 941-0333 FAX: (919) 941-0234

Sample Train Recovery Data EPA Method 23

Facility: Annus	AFB - MD	Project No.: F181.0	υ <u>†</u>											
1 /		Run No.:												
Clean-up person:		Sampling Location:												
	MOW													
Comments:														
	Front-H	alf Data												
Filter No.: un-number	Filter Media: C	Tare Wt (mg)	:											
Filter No.:	Filter Media:	Tate Wt (mg)	:											
Back-Half Data														
:			,											
	XAD-2 Sorbent Resin Trap	Knock-out Impinger	Impinger No. 1											
Contents:	XAD-2 Sorbent Resin	MT	100 ml HPLC H₂O											
Final mass (g):	-	654.3	671.8 ·											
Initial mass (g):	276.5	464.2	619.8											
Net Mass (g)	~	190.1	7.0											
	Impinger No. 2	Impinger No. 3	Impinger No. 4											
Contents:	100 ml HPLC H₂O	MT	Silica Gel											
Final mass (g):	743.7	\$12.0	943.3											
Initial mass (g):	743.6	507-5-	883.9											
Net Mass (g)	01	4.5 +3.5	59.4											
Total Moisture Collected: ((a): 4198.9	1.256.9												
	3/	(12 32)												
Description of Impinger Ca			÷											
Nu 2 F 782	.3 No.3 F 8	19.0 No.4 F	787.1											
1 46	1 46	17 1	461.4											

Central Park vvest 500 i South ivitatif Boutevard, r.o. Box izell Research Triangle Park, North Carolina 27709 (919) 941-0333 FAX: (919) 941-0334

US EPA M23 FIELD DATA SHEET

Plant: Advenus AFG
Sampling Location: Sampling Loca

Sample Type: A35 Operator(s): DDH

Par: 29.90 Ps: 4.14

CO2: 5.02: 4.14

Probe Length/Type: 3.4666 Pitot #: 0.0-1.1

Stack Diameter: 4.76.78

Nozzle ID: ・3つ Thermocouple No.: <u>gt--</u>
Assumed Bws: -3つ Filter No.: <u>DF</u>
Meter Box No.: <u>& & もっちゃらいでいます。 これでいます。 Cfm @ 15</u> in. Hg
Posttest Leak Check Rate: Pitot: -0rsat: <u>ルル</u>

	Pum
	Dry Gas Meter
	XAD
	Impinger
	Filter
	Probe
>	Stack
(K= 5.00)	Orifice Pressure
	Velocity
	Gas Meter Velocity
	۶
	Clock Gas Meter
	Gas Meter

																			_		_			
Pump Vacuum	(III. ng)		ق	9	و	9	૭	૭	و	૭	و	૭	9	9	J	و٠	9	0	و	9	و	9	و	9
Meter rature 7)	Outlet		36	95	47	45	25	27	47	26	36	67	98	48	92	96	56	৫১	48	92	96	≥ 55	66	6.0
Dry Gas Meter Temperature (*F)	Infet		3	47	47	47	52	22	47	85	80	85	96	56	46	44	94	99	49	66	98	46	96	96
XAD Temp	=		44	46	48	48	42	000	50	50	21	31	S	51	36	'n	52	S	52	15	50	57	51	51
Impinger Temp	3		49	419	120	48	44	05	20	51	3.	S	SA	52	5	52	S	S	B	3,5	22	\$4	25	5.
Filter Temp			249	186	120	727	252	-25-	154	155	125	751	252	252	150	120	750	150	233	150	130	150	251	155
Probe Temp (°F)		******	251	757	252	252	252	250	252	250	950	JS 3	253	953	250	250	35 2	751	252	150	250	959	751	150
Stack Temp	3		12,00	171	121	121	121	170	(7.2	יר,	121	121	121	121	121	(74	170	173	172	172	172	122	172	671
ressure ential n H ₂ O)	Actual		1.75	08./	1.80	2.3	1.90	1.75	1.75	1.60	1.60	1.25	08.7	287	1.80	O4.1	1.80	1.75	1.75	1.65	02.7	1.70	1.35	- 7
Orffice Press≀ Differential (△H, in H₂O	Desired		1.75	1.80	1.80	1.75	l Ro	1.75	1.75	1.60	7.60	1.75	(, 80	%.7	08.)	1.80	(.80	1.75	1.75	1.65	1.70	1.70	. X	34.1
Velocity Head	(Or, III 1/2O)		. 35	. 36	. 3(-	.35	.38	.35	.35	. 3.A	£.	. 35	.36	.36	. 360	.36	3	. 35	. 3.5	.33	. 34	34	. 35	35
Gas Meter Reading	(n 'm')	584.300	567.78	591.343	595.020	598.750	105.600	606,013	(009.902)	013.820	251.619	620.705	586.480	072.520	C31,370	635.300	638.810	1640.400	646.035	649 .830	C53.550	050.030	(dec). 317	664.135
Clock	(z4-nr)	0110	2150											0101	050/	1025	0201		^	1045 6		1055		
Sampling Time	(LIE)	۵	W	ó	c,	0/00				0			59	0		عد	15	9/08	85	40	45	001	501	0//
Traverse	Number	- 4				B		÷		61				17				S				૭		

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∆V_m:



Central Park West 5001 South Miami Boulevard, P.O. Box 12077 Research Triangle Park, North Carolina 27709 (919) 941-0333 FAX: (919) 941-0234

US EPA M23 FIELD DATA SHEET

Plant: Archaus AFB	ဟ
74,	α.
Run Number. A-5-3 Date: 03-01-01	O
Pretest Leak Rate: See Cfm @ 15 in. Hg	σ.
Pretest Leak Check: Pitot: Orsat: AM	ဟ

erator(s): DDM	4 . 14	7	Probe Length/Type: 3' colos Pitot #: RP-19	185,78
Ö	۳.	ő		Ϋ́,
M			N	40
Sample Type: 🛂 Operator(s): DDM	Phar: 24.9	502:	Probe Length/Type:	Stack Diameter. 15 3 As:

[Kx=5.00|]

B

Nozzle ID: 315 Thermocouple No.: ロエーC. Assumed Bws: こまり Filter No.: Dピ	Meter Box No.: 248-15 γ: 0.995 ΔΗ@: 1.80	Posttest Leak Rate: .cos cfm @ .s in. Hg	Posttest Leak Check Rate: Pitot: Orsat:
--	--	--	---

Pump	(in. Hg)		7	ı	1	7	1	7	7	7	1	7	7		7	7	7	7	7	7	7	Г	7	ct	
s Meter rature F)	Outlet		10).	101	0	707	101	103	707	103	9	0)	101	101	30/	107	401	101	(03	1001	601	183	3	201	
Dry Gas Meter Temperature (*F)	Inlet		101	101	10)	101	101	707	104	101	õ	õ	/0/	102	103	100/	100	103	103	103	103	103	5 01	(03	T _m .
XAD Temp	î.		8*	47	26	8 4	84	47	47	47	84	48	42	47	47	47	47	48	47	47	18	400	44	49	_
Impinger Temp	(7)		49	4/Ce	26	47	47	147	47	47	47	47	47	47	47	8/2	84	38	84	8/2	49	49	49	\$0	
Filter Temp	(1)		751	452	786	250	252	250	181	187	150	251	155	120	150	120	150	350	720	150	252	150	150	152	
Probe Temp	(1)		253	252	38.	950	251	252	356	18 %	782	250	150	253	150	250	150	.est	400	25.5	250	35.0	350	1221	
Stack Temp	(1)		172	172	173	172	172	(72	172	172	2	(73)	401	173	172	72	(1)	7.72	7 7	17	123	172	172	74	 L*
Differential (ΔH, in H₂O)	Actual		1.85	1.85	7.85	7.80	08.1	1.3	1.75	1.75	1.70	2.70	1.33	K,	1.75	1.80	50.1	1.80	08.7	7.80	1.60	1,600	1,60	1.60	
Orifice Diffe (∆H, i	Desired	- AL-	1.85	1.85	7.85	1.80	7.80	1.75	1.75	£ .	1.70	01.1	1.75	1.75	1.75	(.RD	1,75	√.80	1.80	08.1	1.60	1,60	1.00	1.60	ΔH:
Velocity Head	(22111111111111111111111111111111111111		.37	.37	.37	.36	36	.35	. 25	. 25	.34	.34	35	. 35	.35	.36	. 35	. 36	360	. 36	. 32	. 33	5	25.0	Δp:
Gas Meter Reading	(11 ºE A)		66.870	c. 71.54Ca	GT5.520	₩.₽٢9	683.145	687.019	690.730	164.101	617.940	361.133	716.205	708.860	712,406	316.00	219.630	7081017	737.317	730.501	100.HEC	737.615	ı	1	
Clock Time	(64-1111)		0111	5/11	11.35	1140	1145	1050	1155	1000	1305	1910	12/5	1000	255	9861	1335	0501	13/65	1250	1255	1800	5051	0/21	ΔV _m :_
Sampling Time	(mm)		115	120/0	195	130	/35	041	145	150	551	100	765	00	561	/80	185	190	795	280	305	210	215	320	
Traverse Point				-				P				3				4				2				9	

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FIELD DATA SHEET

Plant: August AFB
Sampling Location Victority (1) kt P
Run Number: W33-3 Date: 2 / 1 / 1 C
Pretest Leak Rate: 6.008 cfm@ (5 in. Hg. P
Pretest Leak Check: Pitot: Orsal: W/A
S

Sample Type: 1Mthults Operator: 0Mt/mmm Pbar: 29.9 Ps: + 0.10 CO2: ~5 O2: ~17 Probe Length/Type: 3'-9655 Pitot #: 49-A Stack Diameter: 15 3/e As:

Ageuraed Bws: ~75 Filter #: UN-Numberd Meter Box #: 6-66 Y: LEQ AH@: L.B.)
Post-Test Leak Rate: 0.35 cfm @ 12-in. Hg.
Post-Test Leak Check; Pitot: __Orsat: N/M

Travers	Sempling	Traverse Sampling Gook Time	Gas Meler	Velent	2						XPD.		
Popular	T eff	124-hour	Banding	The state of	Office riessure Differential	ire Differential	Stack	T	Temperature	Impinger	Dry Gas W	Dry Gas Meter Temp.	Pump
Number		docto	Se land	(do) park	(HØ)	07H	Temp.	٥	0 F	Temp.	Filet 1	Oute	Vacuum
	1_		n (ma)	m F20	Desired	Actual	E	Probe	Filter	4	Ca hor	(Tm out P	(g. 14)
1	4	i	- 1	11111111									
9	200	शेंट ट्रं	451.0	6.37	1.6	1.6	(73	250	241	S	13	11.5 1.00	100
	35,5	1520	+55.6	0.32	ر	ر	751	750	252	\$	49	_	5 5
	123	(578-	754.8	6.33	<u>لا</u>	1.68	241	249	752	•		7	+
	240	1330	764.302	25.0	رد	3	7	74.	300	7 7		_	rt
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Central Park West 5001 South Miami Boulevard, P.O. Box 12077 Research Triangle Park, North Carolina 27709 (919) 941-0333 FAX: (919) 941-0234

Sample Train Recovery Data EPA Method 23

Facility: Hallows	S AAB- MM	Project No.: FIBI . OL						
		Run No.: W23-3						
Clean-up person:	mom	Sampling Location:						
	MAM	A4.						
Comments:								
	Front-H	alf Data						
ilter No.: UN - Nunktu	Filter Media: 6	F Tare Wt (mg)	*					
ilter No.:	Filter Media:	Tate Wt (mg)	•					
		·						
	Back-H	alf Data						
	XAD-2 Sorbent Resin Trap	Knock-out Impinger	Impinger No. 1					
Contents:	XAD-2 Sorbent Resin	МТ	100 ml HPLC H₂O					
Final mass (g):	320.0	£74.8	5 70.8 ·					
Initial mass (g):	305.4	4956	582.8					
Net Mass (g)		379.2						
		٨						
·	Impinger No. 2	Impinger No. 3	Impinger No. 4					
Contents:	100 ml HPLC H₂O	MT	Silica Gel					
Final mass (g):	739.8	633.4	1083.2					
		678.7	1674.0					
Initial mass (g):	740.9		(64.6					

Appendix B.3
Raw Field Data
Hydrogen Chloride



Pre-test:

Post-test:

VOLATILE ORGANIC SAMPLING TRAIN (VOST) SAMPLING DATA

COMPANY: Awrens AFR	CITY: 12- shine to a DC
DATE: 01/31/01	LOCATION: Stenck
11ME:1145	RIIN # - Maco - L
METER #: VB-6	Y-FACTOR: 1.004
BAROMETRIC PRESSURE, in. Hg: 29.9	OPERATOR: DDH
AMBIENT TEMPERATURE, °F:	PURGE TIME:

LEAK CHECK DATA

Vacuum

Initial, (in. Hg) Final, (in. Hg) Time, (min.)

Sample Time (min)	Clock Time, (24-hr)	Meter Volume, (liter)	Rotometer Setting	Dry Gas Meter Temp., (°F)	Vacuum, (in. Hg)
D	10:45	1323.00	۵.0	87	2
5	10:50	1333.35	۵.۵	44	Q
10	10:55	1343.12	٥.٥	P 7	3
15	11:00	1353. 21	a. 0	88	3
20	11:05	1363.19	2.0	88	ے
25	11:10	1373.31	3.0	88	3
30	11:15	1383.10	2.0	91	3
35	11:20	1393.70	٥.٥	91	- 3
40	11:25	1403:10	٥.0	90	3
45	11:30	1413.21	2.0	92	3
50	11. 35	1423.10	2.0	92	3
55	11:40	1433.61	2.0	92	3

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Nitrogen purge/activated carbon packing in sample holding container:_____

$$V_{\text{std}} = V_{\text{m}} \text{(liters)} \times Y \times 17.647 \times \frac{P_{\text{b}} \text{(in. Hg)}}{T_{\text{m}} (^{\circ}\text{R})}$$

Pre-test:

Post-test:

VOLATILE ORGANIC SAMPLING TRAIN (VOST) SAMPLING DATA

COMPANY: Andrews AFB	CITY: DC
DATE: 01/31/01	
TIME: 1610	RUN #: M26-2
METER #: VB-6	
BAROMETRIC PRESSURE, in. Hg: 29.9	
AMBIENT TEMPERATURE. °F:	

LEAK CHECK DATA

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Va	-		
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Initial, (in. Hg) Final, (in. Hg)

15

15

Time, (min.) ABORTED RUN

Run Aborteo

Sample Time (min)	Clock Time, (24-hr)	Meter Volume, (liter)	Rotometer Setting	Dry Gas Meter Temp., (°F)	Vacuum, (in. Hg)
0	1610	14 35. 90	J.O LPM	89	3
5	1615	1453.87		80	5
10	1620	1463.81		₹ O	3
15	1625	1473.73		90	3
20	1630	1483.81		91	. 3
25	1635	1493.21		91	3
	1640	1503.17		91	3
	1645	1513.21		91	3
	1650	1523.20		91	3
	1655	1533.17		91	3
	1700	1543.22		91	3
	1705	1553.17	V	91	ব

Nitrogen purge/activated carbon packing in sample holding container:

$$V_{\text{std}} = V_{\text{m}} \text{(liters)} \times Y \times 17.647 \times \frac{P_{\text{b}} \text{(in. Hg)}}{T_{\text{m}} (^{\circ}\text{R})}$$

$$V_{\text{std}} =$$



VOLATILE ORGANIC SAMPLING TRAIN (VOST) SAMPLING DATA

COMPANY: Andrews AFB	CITY: washington De
DATE: 03/01/01	LOCATION: Stark
TIME: 0910 - 1010	BIN #: mac = 1 2 1
	Y-FACTOR: 1.004
BAROMETRIC PRESSURE, in. Hg: 39.90	OPERATOR: 204
AMBIENT TEMPERATURE, °F: (90)	PLIBGE TIME:

LEAK CHECK DATA

Vacuum

Initial, (in. Hg) Final, (in. Hg) Time, (min.) Pre-test: 15" 15" Post-test:

	Sample Time (min)	Clock Time, (24-hr)	Meter Volume, (liter)	Rotometer Setting	Dry Gas Meter Temp., (°F)	Vacuum, (in. Hg)	
	0	0910	1565.55	2.0(LPM)		3	٥
	5	0915	1575.60	3.0	108	<u>ع</u>	د
7	10	0920	1585.41	٥.د	108	3	ء
45	15	0925	1595. 23	3.0	109	3	
\$	20	0930	1605.17	2.0	169	3	
	25	0935	1615.29	2.0	109	3	
. 34	30	0940	1625. 42	2.0	110.	3	
	35	0945	1635. 50	۵.٥	110	3	
- L	40	0950	1645.40	2.0	110	3	
- 7	45	0955	1655.32	3.0	110	3	
	50	1000	1665.19	2.0	110	3	
	55	1005	1675.29	2.0	//0	3	-
	GO Jitrogen purae	1010	1685.36	2:0-	110-	3	_

Nitrogen purge/activated carbon packing in sample holding container:____

$$V_{\text{std}} = V_{\text{m}} \text{(liters)} \times Y \times 17.647 \times \frac{P_{\text{b}} \text{(in. Hg)}}{T_{\text{m}} (^{\circ}\text{R})}$$

 $V_{\text{std}} =$



VOLATILE ORGANIC SAMPLING TRAIN (VOST) SAMPLING DATA

COMPANY: Andrews AFB	CITY: Washington DC
DATE: 02-02-01	LOCATION: Stack
TIME:	RUN #: Mac - # 3
METER #: VB -6	Y-FACTOR: 1:004
BAROMETRIC PRESSURE, in. Hg: 29.9	
AMBIENT TEMPERATURE. °F: 89	

LEAK CHECK DATA

Vacuum

	Initial, (in. Hg)	Final, (in. Hg)	Time, (min.)	
Pre-test:				
Post-test:				

Sample Time (min)	Clock Time, (24-hr)	Meter Volume, (liter)	Rotometer Setting	Dry Gas Meter Temp., (°F)	Vacuum, (in. Hg)
0	0945	۵.٥	1707,00	88	3
5	0950	2.0	1717.12	88	3
10	0955	2.0	1727.09	82	M
15	1000	2.0	1737. 10	88	M
90	1005	2.0	1747.21	ያነ	3
25	1010	2.0	1757.19	40	3
30	1015	2.0	1767.23	40	N
35	1025	2.0	1787.19	90	3
40	1030	a.o	1787.26	Ç	3
45	1035	2.0	1797. 31	91	3
50	1040	2.0	1807.21	91	3
55	1045	ن.ي	1817.32	91	3

Nitrogen purge/activated carbon packing in sample holding container:

$$V_{std} = V_{m} (liters) \times Y \times 17.647 \times \frac{P_{b} (in. Hg)}{T_{m} (^{\circ}R)}$$

Appendix B.4

Raw Field Data

CO₂, O₂, SO₂, NO_x, CO CEMS (M3A, M6C, 7E, 10)

Medical Waste Incinerator CEM Responses

Date	Time	O2	CO2
31-Jan-01	11:13:15	10.055	5.659
31-Jan-01	11:14:15	10.784	5.529
31-Jan-01	11:15:15	10.336	5.245
31-Jan-01	11:16:15	10.981	5.02
31-Jan-01	11:17:15	12.067	4.993
31-Jan-01	11:18:15	12.374	5.198
31-Jan-01	11:19:15	12.5	5.507
31-Jan-01	11:20:15	12.865	5.801
31-Jan-01	11:21:15	13.414	6.02
31-Jan-01	11:22:15	13.929	6.115
31-Jan-01	11:23:15	9.623	6.085
31-Jan-01	11:24:15	8.689	6.001
31-Jan-01	11:25:15	10.295	5.856
31-Jan-01	11:26:15	9.827	5.673
31-Jan-01	11:27:15	10.649	5.545
31-Jan-01	11:28:15	11.78	5.621
31-Jan-01	11:29:00	· 11	6
31-Jan-01	11:30:00	11.75	- 6
31-Jan-01	11:31:00	12.25	6.4
31-Jan-01	11:32:00	12.5	6.4
31-Jan-01	11:33:00	13	6.4
31-Jan-01	11:34:00	13.75	6.4
31-Jan-01	11:35:00	13.5	6.4
31-Jan-01	11:36:00	9.25	6.4
31-Jan-01	11:37:00	10	6.4
31-Jan-01	11:38:00	9.5	6
31-Jan-01	11:39:00	10.5	6.4
31-Jan-01	11:40:00	12	6.4
31-Jan-01	11:41:45	13.415	6.409
31-Jan-01	11:42:45	13.613	6.541
31-Jan-01	11:43:45	10.964	6.566
31-Jan-01	11:44:45	9.35	6.505
31-Jan-01	11:45:45	10.111	6.359
31-Jan-01	11:46:45	10.108	6.168
31-Jan-01	11:47:45	10.864	5.954
31-Jan-01	11:48:45	11.596	5.818
31-Jan-01	11:49:45	12.179	5.81
31-Jan-01	11:50:45	12.615	5.94
31-Jan-01	11:51:45	12.534	6.132
31-Jan-01	11:52:45	12.736	6.301
31-Jan-01	11:53:45	13.047	6.403

Medical Waste Incinerator CEM Responses

Date	Time	O2	CO2
31-Jan-01	11:54:45	13.338	6.433
31-Jan-01	11:55:45	10.8	6.388
31-Jan-01	11:56:45	8.601	6.28
31-Jan-01	11:57:45	7.645	6.134
31-Jan-01	11:58:45	8.61	5.967
31-Jan-01	11:59:45	9.654	5.805
31-Jan-01	12:00:45	10.38	5.718
31-Jan-01	12:01:45	10.679	5.768
31-Jan-01	12:02:45	11.02	6.021
31-Jan-01	12:03:45	11.119	6.388
31-Jan-01	12:04:45	11.522	6.76
31-Jan-01	12:05:45	11.932	6.779
31-Jan-01	12:06:45	8.933	8.359
31-Jan-01	12:07:45	8.012	9.079
31-Jan-01	12:08:45	9.739	8.005
31-Jan-01	12:09:45	11.224	6.74
31-Jan-01	12:10:45	11.445	6.448
31-Jan-01	12:11:45	11.565	6.301
31-Jan-01	12:12:45	11.925	5.998
31-Jan-01	12:13:45	12.256	5.73
31-Jan-01	12:14:45	12.547	5.517
31-Jan-01	12:15:45	10.502	7.305
31-Jan-01	12:16:45	9.121	8.283
31-Jan-01	12:17:45	9.61	7.726
31-Jan-01	12:18:45	9.988	7.513
31-Jan-01	12:19:45	10.988	6.74
31-Jan-01	12:20:45	11.583	6.253
31-Jan-01	12:21:45	11.924	5.946
31-Jan-01	12:22:45	12.01	5.871
31-Jan-01	12:23:45	12.073	5.767
31-Jan-01	12:24:45	12.134	5.719
31-Jan-01	12:25:45	12.145	5.738
31-Jan-01			
31-Jan-01	12:27:48	12.242	5.641
31-Jan-01	12:28:48	12.423	5.557
31-Jan-01	12:29:48	12.76	5.277
31-Jan-01	12:30:48	12.007	5.786
31-Jan-01	12:31:48	6.936	10.28
31-Jan-01	12:32:48	7.837	9.129
31-Jan-01	12:33:48	9.992	7.577
31-Jan-01	12:34:48	11.469	6.464

Medical Waste Incinerator CEM Responses

Date	Time	O2	CO2
31-Jan-01	12:35:48	11.682	6.202
31-Jan-01	12:36:48	11.73	6.079
31-Jan-01	12:37:48	11.967	5.846
31-Jan-01	12:38:48	12.083	5.728
31-Jan-01	12:39:48	12.353	5.545
31-Jan-01	12:40:48	12.815	5.239
31-Jan-01	12:41:48	8.464	9.2
31-Jan-01	12:42:48	7.617	9.285
31-Jan-01	12:43:48	8.816	8.44
31-Jan-01	12:44:48	11.097	6.856
31-Jan-01	12:45:48	11.683	6.518
31-Jan-01	12:46:48	11.833	6.536
31-Jan-01	12:47:48	12.445	6.529
31-Jan-01	12:48:48	12.839	6.495
31-Jan-01	12:49:48	13.121	6.4
31-Jan-01	12:50:48	12.778	6.238
31-Jan-01	12:51:48	8.399	6.026
31-Jan-01	12:52:48	8.944	5.809
31-Jan-01	12:53:48	10.595	5.629
31-Jan-01	12:54:48	11.406	5.591
31-Jan-01	12:55:48	12.046	5.871
31-Jan-01	12:56:48	12.483	6.343
31-Jan-01	12:57:48	12.66	6.73
31-Jan-01	12:58:48	12.849	6.906
31-Jan-01	12:59:48	12.907	6.893
31-Jan-01	13:00:48	13.156	6.722
31-Jan-01	13:01:48	13.396	6.487
31-Jan-01	13:02:48	13.774	6.236
31-Jan-01	13:03:48	9.86	6.002
31-Jan-01	13:04:48	10.645	5.796
31-Jan-01	13:05:48	11.49	5.625
31-Jan-01	13:06:48	11.997	5.473
31-Jan-01	13:07:48	12.523	5.411
31-Jan-01	13:08:48	13.028	5.502
31-Jan-01	13:09:48	13.311	5.705
31-Jan-01	13:10:48	13.266	5.884
31-Jan-01	13:11:48	13.717	6.012
31-Jan-01	13:12:48	13.691	6.021
31-Jan-01	13:13:48	7.006	5.962
31-Jan-01	13:14:48	7.752	5.84
31-Jan-01	13:21:28	13.122	6.398

Medical Waste Incinerator CEM Responses

Date	Time	O2	CO2	
31-Jan-01	13:22:28	13.458	6.662	
31-Jan-01	13:23:28	13.545	6.782	
31-Jan-01	13:24:28	13.678	6.76	
31-Jan-01	13:25:28	13.818	6.627	
31-Jan-01	13:26:28	13.498	6.448	
31-Jan-01	13:27:28	8.847	6.252	
31-Jan-01	13:28:28	10.286	6.042	
31-Jan-01	13:29:28	11.133	5.823	
31-Jan-01	13:30:28	12.002	5.646	
31-Jan-01	13:31:28	12.883	5.498	
31-Jan-01	13:32:28	13.114	5.388	
31-Jan-01	13:33:28	13.604	5.395	
31-Jan-01	13:34:28	13.621	5.488	
31-Jan-01	13:35:28	14.023	5.645	
31-Jan-01	13:36:28	11.906	5.788	
31-Jan-01	13:37:28	7.151	5.875	
31-Jan-01	13:38:28	8.413	5.902	
31-Jan-01	13:39:28	10.824	5.858	
31-Jan-01	13:40:28	12.032	5.772	
31-Jan-01	13:41:28	12.002	0.772	
31-Jan-01	13:42:28			
31-Jan-01	13:43:28			
31-Jan-01	13:44:28			
31-Jan-01	13:45:28			
31-Jan-01	13:46:28			Cal Check
31-Jan-01	13:47:28			
31-Jan-01	13:48:28			
31-Jan-01	13:49:28			
31-Jan-01	13:50:28			
31-Jan-01	13:51:28			
31-Jan-01	13:52:28			
31-Jan-01	13:53:28	12.621	5.473	
31-Jan-01	13:54:28	12.871	5.265	
31-Jan-01	13:55:28	13.048	5.089	
31-Jan-01	13:56:28	13.23	4.976	
31-Jan-01	13:57:28	13.713	4.601	
31-Jan-01	13:58:28	14.062	4.329	
31-Jan-01	13:59:28	14.146	4.326	
31-Jan-01	14:00:28	9.544	8.492	
31-Jan-01	14:01:28	10.043	7.492	
31-Jan-01	14:02:28	10.03	7.423	

Medical Waste Incinerator CEM Responses

Date	Time	02	CO2
31-Jan-01	14:03:28	11.203	6.543
31-Jan-01	14:04:28	11.992	5.932
31-Jan-01	14:05:28	12.75	5.32
31-Jan-01	14:06:28	13.009	5.089
31-Jan-01	14:07:28	13.187	4.976
31-Jan-01	14:08:28	13.815	4.542
31-Jan-01	14:09:28	14.248	4.216
31-Jan-01	14:10:28	14.24	4.178
31-Jan-01	14:11:28	14.347	4.097
31-Jan-01	14:12:28	14.618	3.894
31-Jan-01	14:13:28	14.697	3.828
31-Jan-01	14:14:28	14.873	3.768
31-Jan-01	14:15:28	10.243	7.832
31-Jan-01	14:16:28	9.986	7.5
31-Jan-01	14:17:28	9.246	7.792
31-Jan-01	14:18:28	9.805	7.58
31-Jan-01	14:19:28	11.121	6.548
31-Jan-01	14:20:28	12.251	5.755
31-Jan-01	14:21:28	13.267	4.976
31-Jan-01	14:22:28	13.933	4.482
31-Jan-01	14:23:28	14.08	4.295
31-Jan-01	14:24:28	14.354	4.122
31-Jan-01	14:25:28	14.684	3.864
31-Jan-01	14:26:28	14.592	3.888
31-Jan-01	14:27:28	14.781	3.763
31-Jan-01	14:28:28	15.141	3.581
31-Jan-01	14:29:28	10.97	7.203
31-Jan-01	14:30:28	10.477	7.225
31-Jan-01	14:31:28	9.971	7.284
31-Jan-01	14:32:28	10.297	7.242
31-Jan-01	14:33:28	12.03	5.878
31-Jan-01	14:34:28	13.047	5.137
31-Jan-01	14:35:28	13.439	4.792
31-Jan-01	14:36:28	13.944	4.455
31-Jan-01	14:37:28	14.03	4.358
31-Jan-01	14:38:28	14.324	4.145
31-Jan-01	14:39:28	14.53	3.97
31-Jan-01	14:40:28	14.803	3.825
31-Jan-01	14:41:28	11.39	6.654
31-Jan-01	14:42:28	8.339	8.695
31-Jan-01	14:43:28	8.546	8.532

Medical Waste Incinerator CEM Responses

D - 1 -	August		
Date	Time	O2	CO2
31-Jan-01	14:44:28	9.154	8.18
31-Jan-01	14:45:28	10.339	7.289
31-Jan-01	14:46:28	11.113	6.65
31-Jan-01	14:47:28	11.122	6.624
31-Jan-01	14:48:28	11.325	6.423
31-Jan-01	14:49:28	11.308	6.383
Average	M23-1	11.7	6.1

Medical Waste Incinerator CEM Responses

Date	Time	O2	CO2	
31-Jan-01	16:10:42	13.981	4.38	
31-Jan-01	16:11:42	14.323	4.125	
31-Jan-01	16:12:42	14.511	3.97	
31-Jan-01	16:13:42	14.717	3.81	
31-Jan-01	16:14:42	15.139	3.565	
31-Jan-01	16:15:42	11.357	6.914	
31-Jan-01	16:16:42	8.068	8.967	
31-Jan-01	16:17:42	9.252	8.032	
31-Jan-01	16:18:42	10.875	6.827	
31-Jan-01	16:19:42	12.376	5.693	
31-Jan-01	16:20:42	12.874	5.242	
31-Jan-01	16:21:42	13.247	4.908	
31-Jan-01	16:22:42	13.504	4.713	
31-Jan-01	16:23:42	13.887	4.435	
31-Jan-01	16:24:42	14.188	4.208	
31-Jan-01	16:25:42	14.625	3.936	
31-Jan-01	16:26:42	10.514	7.581	
31-Jan-01	16:27:42	9.016	8.377	
31-Jan-01	16:28:42	9.451	7.862	
31-Jan-01	16:29:42	10.719	6.888	
31-Jan-01	16:30:42	11.758	6.1	
31-Jan-01	16:31:42	12.387	5.596	
31-Jan-01	16:32:42	12.623	5.362	
31-Jan-01	16:33:42	12.948	5.121	
31-Jan-01	16:34:42	13.485	4.691	
31-Jan-01	16:35:42	13.512	4.661	
31-Jan-01	16:36:42	13.858	4.409	
31-Jan-01	16:37:42			
31-Jan-01	16:38:42			
31-Jan-01	16:39:42		1	
31-Jan-01	16:40:42			Cal Check
31-Jan-01	16:41:42			
31-Jan-01	16:42:42			
31-Jan-01	16:43:42			
31-Jan-01	16:44:42			
31-Jan-01	16:45:42			
31-Jan-01	16:46:42	12.411	5.565	
31-Jan-01	16:47:42	12.782	5.275	
31-Jan-01	16:48:42	13.028	5.042	
31-Jan-01	16:49:42	13.404	4.776	
31-Jan-01	16:50:42	13.798	4.484	

Medical Waste Incinerator CEM Responses

Date	Time	O2	CO2
31-Jan-01	16:51:42	14.074	4.255
31-Jan-01	16:52:42	14.391	4.062
31-Jan-01	16:53:42	9.81	8.222
31-Jan-01	16:54:42	9.805	7.702
31-Jan-01	16:55:42	9.801	7.648
31-Jan-01	16:56:42	10.562	7.084
31-Jan-01	16:57:42	11.329	6.505
31-Jan-01	16:58:42	11.938	6.049
31-Jan-01	16:59:42	12.236	5.793
31-Jan-01	17:00:42	12.407	5.653
31-Jan-01			
31-Jan-01	17:02:21	11.124	7.005
31-Jan-01	17:03:21	8.432	9.16
31-Jan-01	17:04:21	9.374	8.09
31-Jan-01	17:05:21	9.956	7.591
31-Jan-01	17:06:21	10.945	6.774
31-Jan-01	17:07:21	11.587	6.287
31-Jan-01	17:08:21	12.097	5.852
31-Jan-01	17:09:21	12.248	5.719
31-Jan-01	17:10:21	12.336	5.642
31-Jan-01	17:11:21	12.782	5.282
31-Jan-01	17:12:21	13.096	5.036
31-Jan-01	17:13:21	13.166	4.967
31-Jan-01	17:14:21	10.991	7.269
31-Jan-01	17:15:21	7.328	9.699
31-Jan-01	17:16:21	8.221	8.861
31-Jan-01	17:17:21	10.311	7.37
31-Jan-01	17:18:21	12.459	5.77
31-Jan-01	17:19:21	12.763	5.363
31-Jan-01	17:20:21	13.015	5.123
31-Jan-01	17:21:21	13.23	4.945
31-Jan-01	17:22:21	13.551	4.705
31-Jan-01	17:23:21	14.065	4.342
31-Jan-01	17:24:21	10.662	7.475
31-Jan-01	17:25:21	10.297	7.304
31-Jan-01	17:26:21	11.009	6.606
31-Jan-01	17:27:21	10.867	6.711
31-Jan-01	17:28:21	11.458	6.26
31-Jan-01	17:29:21	11.976	5.867
31-Jan-01	17:30:21	13.084	5.053
31-Jan-01	17:31:21	13.52	4.713

Medical Waste Incinerator CEM Responses

Date	Time	O2	CO2
		02	CO2
31-Jan-01	17:32:21	14.007	4.373
31-Jan-01	17:33:21	13.843	4.447
31-Jan-01	17:34:21	14.216	4.173
31-Jan-01	17:35:21	14.486	3.963
31-Jan-01	17:36:21	14.658	3.826
31-Jan-01	17:37:21	14.75	3.759
31-Jan-01	17:38:21	14.852	3.67
31-Jan-01	17:39:21	14.928	3.613
31-Jan-01	17:40:21	14.975	3.585
31-Jan-01	17:41:21	14.94	3.617
31-Jan-01	17:42:21	12.031	6.471
31-Jan-01	17:43:21	8.693	8.513
31-Jan-01	17:44:21	9.304	7.907
31-Jan-01	17:45:21	11.288	6.432
31-Jan-01	17:46:21	12.6	5.468
31-Jan-01	17:47:21	13.098	5.039
31-Jan-01	17:48:21	13.464	4.744
31-Jan-01	17:49:21	13.682	4.542
31-Jan-01	17:50:21	14.071	4.275
31-Jan-01	17:51:21	14.689	3.862
31-Jan-01	17:52:21	9.804	8.31
31-Jan-01	17:53:21	10.491	7.174
31-Jan-01	17:54:21	11.466	6.392
31-Jan-01	17:55:21	11.768	6.168
31-Jan-01	17:56:21	12.659	5.469
31-Jan-01	17:57:21	12.742	5.345
31-Jan-01	17:58:21	13.144	5.038
31-Jan-01	17:59:21	13.244	4.925
31-Jan-01	18:00:21	13.456	4.748
31-Jan-01	18:01:21	13.84	4.471
31-Jan-01	18:02:21	14.093	4.292
31-Jan-01 31-Jan-01	18:03:21	14.473	4.045
31-Jan-01	18:04:21	10.853	7.466
31-Jan-01	18:05:21 18:06:21	10.612	7.12
31-Jan-01	18:07:21	11.108	6.613
31-Jan-01	18:08:21	11.366	6.408
31-Jan-01	18:09:21	12.341	5.642
31-Jan-01	18:10:21	12.864 12.804	5.208
31-Jan-01	18:11:21		5.187
31-Jan-01	18:12:21	13.256	4.841
Juli-01	10.12.21	13.732	4.505

Malcolm Grow Medical Center - Andrews AFB, MD Medical Waste Incinerator CEM Responses

Date	Time	O2	CO2
31-Jan-01	18:13:21	14.112	4.237
31-Jan-01	18:14:21	11.466	6.834
31-Jan-01	18:15:21	7.967	9.059
31-Jan-01	18:16:21	8.954	8.206
31-Jan-01	18:17:21	10.433	7.106
31-Jan-01	18:18:21	11.703	6.15
31-Jan-01	18:19:21	12.274	5.681
31-Jan-01	18:20:21	12.514	5.458
31-Jan-01	18:21:21	12.944	5.144
31-Jan-01	18:22:21	13.316	4.857
31-Jan-01	18:23:21	13.795	4.496
31-Jan-01	18:24:21	13.879	4.411
31-Jan-01	18:25:21	11.887	6.416
31-Jan-01	18:26:21	8.705	8.851
31-Jan-01	18:27:21	9.937	7.551
31-Jan-01	18:28:21	10.581	6.997
31-Jan-01	18:29:21	11.57	6.21
31-Jan-01	18:30:21	12.434	5.607
31-Jan-01	18:31:21	12.947	5.195
31-Jan-01	18:32:21	13.364	4.846
31-Jan-01	18:33:21	13.671	4.581
31-Jan-01	18:34:21	14.1	4.265
31-Jan-01	18:35:21	14.164	4.193
31-Jan-01	18:36:21	14.485	3.965
31-Jan-01	18:37:21	14.694	3.797
31-Jan-01	18:38:21	14.84	3.693
31-Jan-01	18:39:21	14.978	3.636
31-Jan-01	18:40:21	9.458	8.634
31-Jan-01	18:41:21	9.4	8.097
31-Jan-01	18:42:21	9.748	7.732
31-Jan-01	18:43:21	10.776	6.868
31-Jan-01	18:44:21	11.989	5.951
31-Jan-01	18:45:21	12.714	5.406
31-Jan-01	18:46:21	13.014	5.148
31-Jan-01	18:47:21	13.229	4.964
31-Jan-01	18:48:21	13.152	4.989
31-Jan-01	18:49:21	12.136	6.112
31-Jan-01	18:50:21	7.219	10.038
31-Jan-01	18:51:21	7.664	9.392
31-Jan-01	18:52:21	9.429	8.28
31-Jan-01	18:53:21	11.403	6.834

Medical Waste Incinerator CEM Responses

Date	Time	O2	CO2
31-Jan-01	18:54:21	11.882	6.371
31-Jan-01	18:55:21	11.692	6.383
31-Jan-01	18:56:21	11.826	6.239
31-Jan-01	18:57:21	12.156	5.929
31-Jan-01	18:58:21	12.321	5.787
31-Jan-01	18:59:21	12.45	5.666
31-Jan-01	19:00:21	12.816	5.37
31-Jan-01	19:01:21	13.087	5.209
31-Jan-01	19:02:21	8.274	9.598
31-Jan-01	19:03:21	9.977	7.787
31-Jan-01	19:04:21	11.253	6.646
31-Jan-01	19:05:21	11.716	6.28
31-Jan-01	19:06:21	12.394	5.753
31-Jan-01	19:07:21	12.829	5.391
31-Jan-01	19:08:21	13.214	5.079
31-Jan-01	19:09:21	13.553	4.805
31-Jan-01	19:10:21	13.663	4.695
31-Jan-01	19:11:21	13.823	4.565
31-Jan-01	19:12:21	14.309	4.224
31-Jan-01	19:13:21	10.581	7.677
31-Jan-01	19:14:21	9.505	8.089
31-Jan-01	19:15:21	10.174	7.499
31-Jan-01	19:16:21	10.977	6.83
31-Jan-01	19:17:21	11.736	6.203
31-Jan-01	19:18:21	12.291	5.763
31-Jan-01	19:19:21	12.589	5.501
31-Jan-01	19:20:21	13.08	5.102
31-Jan-01	19:21:21	13.241	4.949
31-Jan-01	19:22:21	13.502	4.761
31-Jan-01	19:23:21	13.908	4.452
31-Jan-01 31-Jan-01	19:24:21 19:25:21	11.564	6.722
31-Jan-01	19:25:21	8.584	8.748
31-Jan-01	19:20:21	9.973 11.184	7.439
31-Jan-01	19.21.21	11.104	6.522
31-Jan-01	19:29:31	13.399	4 000
31-Jan-01	19:30:31		4.836
31-Jan-01	19:30:31	13.686	4.603
31-Jan-01	19:31:31	14.023 14.344	4.335
31-Jan-01	19:32:31	14.344 14.811	4.098
31-Jan-01	19:33:31		3.774
0 1-Jaii-U I	13.34.31	9.996	8.011

Malcolm Grow Medical Center - Andrews AFB, MD Medical Waste Incinerator CEM Responses

Date	Time	O2	CO2
31-Jan-01	19:35:31	8.861	8.328
31-Jan-01	19:36:31	10.395	7.09
31-Jan-01	19:37:31	11.673	6.136
31-Jan-01	19:38:31	12.531	5.494
31-Jan-01	19:39:31	13.025	5.123
31-Jan-01	19:40:31	13.637	4.646
31-Jan-01	19:41:31	14.154	4.229
31-Jan-01	19:42:31	14.488	3.958
31-Jan-01	19:43:31	14.681	3.827
31-Jan-01	19:44:31	14.482	3.929
31-Jan-01	19:45:31	14.65	3.818
31-Jan-01	19:46:31	14.763	3.725
31-Jan-01	19:47:31	13.48	5.136
31-Jan-01	19:48:31	10.616	7.368
31-Jan-01	19:49:31	9.963	7.554
31-Jan-01	19:50:31	9.083	8.168
31-Jan-01	19:51:31	10.554	7.018
31-Jan-01	19:52:31	11.621	6.196
31-Jan-01	19:53:31	12.34	5.642
31-Jan-01	19:54:31	12.604	5.438
31-Jan-01	19:55:31	12.937	5.156
31-Jan-01	19:56:31	13.312	4.863
31-Jan-01	19:57:31	11.965	6.191
31-Jan-01	19:58:31	9.017	8.68
31-Jan-01	19:59:31	10.349	7.241
31-Jan-01	20:00:31	10.987	6.671
31-Jan-01 31-Jan-01	20:01:31	11.524	6.265
31-Jan-01 31-Jan-01	20:02:31 20:03:31	11.797 12.178	6.051
31-Jan-01	20:03:31	12.176	5.749
31-Jan-01	20:04:31	12.3	5.646 5.474
31-Jan-01	20:05:31	12.499	5.508
31-Jan-01	20:07:31	9.349	8.619
31-Jan-01	20:08:31	10.128	7.439
31-Jan-01	20:09:31	10.879	6.711
31-Jan-01	20:10:31	11.749	6.062
31-Jan-01	20:11:31	12.654	5.395
31-Jan-01	20:12:31	13.087	5.03
31-Jan-01	20:13:31	13.271	4.88
31-Jan-01	20:14:31	13.468	4.719
31-Jan-01	20:15:31	13.586	4.615

Malcolm Grow Medical Center - Andrews AFB, MD Medical Waste Incinerator CEM Responses

M23-2

	_			
Date	Time	O2	CO2	
31-Jan-01	20:16:31	11.945	6.43	
31-Jan-01	20:17:31	9.95	7.911	
31-Jan-01	20:18:31	10.619	7.092	
31-Jan-01	20:19:31	10.632	7.096	
31-Jan-01	20:20:31	11.807	6.171	
31-Jan-01	20:21:31	12.609	5.507	
31-Jan-01	20:22:31	12.945	5.209	
31-Jan-01	20:23:31	13.196	5.008	
31-Jan-01	20:24:31	13.467	4.789	
31-Jan-01	20:25:31	13.365	4.856	
31-Jan-01	20:26:31	14.008	4.406	
31-Jan-01	20:27:31	10.33	7.846	
31-Jan-01	20:28:31	10.006	7.474	
31-Jan-01	20:29:31	11.794	7.05	
31-Jan-01	20:30:31			
31-Jan-01	20:31:31			
31-Jan-01	20:32:31			
31-Jan-01	20:34:00			
31-Jan-01	20:35:00			Cal Check
31-Jan-01	20:36:00			
31-Jan-01	20:37:00			
31-Jan-01	20:38:00			
31-Jan-01	20:39:00			
31-Jan-01	20:40:00			

Average M23-2

12.2

5.9

Medical Waste Incinerator CEM Responses

Date	Time	O2	CO2
2/ 1/101	9:10:00	12.832	5.33
2/ 1/101	9:11:00	13.373	4.869
2/ 1/101	9:12:00	13.966	4.419
2/ 1/101	9:13:00	14.29	4.17
2/ 1/101	9:14:00	14.513	3.989
2/ 1/101	9:15:00	13.408	4.554
2/ 1/101	9:16:00	13.451	4.574
2/ 1/101	9:17:00	10.678	7.566
2/ 1/101	9:18:00	9.866	7.777
2/ 1/101	9:19:00	9.84	7.612
2/ 1/101	9:20:00	10.2	7.443
2/ 1/101	9:21:00	12.279	5.749
2/ 1/101	9:22:00	12.997	5.158
2/ 1/101	9:23:00	13.609	4.676
2/ 1/101	9:24:00	13.882	4.425
2/ 1/101	9:25:00	13.991	4.314
2/ 1/101	9:26:00	14.214	4.142
2/ 1/101	9:27:00	14.517	3.902
2/ 1/101	9:28:00	13.94	4.221
2/ 1/101	9:29:00	13.846	4.275
2/ 1/101	9:30:00	14.453	3.941
2/ 1/101	9:31:00	10.26	7.872
2/ 1/101	9:32:00	9.142	8.036
2/ 1/101	9:33:00	8.592	8.282
2/ 1/101	9:34:00	10.308	7.231
2/ 1/101	9:35:00	12.22	5.866
2/ 1/101	9:36:00	12.845	5.333
2/ 1/101	9:37:00	13.379	4.882
2/ 1/101 2/ 1/101	9:38:00	13.968	4.387
2/ 1/101	9:39:00	14.439	4.032
2/ 1/101	9:40:00 9:41:00	14.248 10.234	4.416 7.878
2/ 1/101	9:42:00	11.043	
2/ 1/101	9:43:00	9.472	6.824 7.999
2/ 1/101	9:44:00	10.376	7.322
2/ 1/101	9:45:00	11.534	6.376
2/ 1/101	9:46:00	12.437	5.668
2/ 1/101	9:47:00	13.16	5.079
2/ 1/101	9:48:00	13.625	4.721
2/ 1/101	9:49:00	14.316	4.246
2/ 1/101	9:50:00	10.638	7.819
			0 10

Medical Waste Incinerator CEM Responses

Date	Time	O2	CO2		
2/ 1/101	9:51:00	10.535	7.33		
2/ 1/101	9:52:00	8.936	8.458		
2/ 1/101	9:53:00	8.673	8.738		
2/ 1/101	9:54:00	10.017	7.619		
2/ 1/101	9:55:00	10.574	7.152		
2/ 1/101	9:56:00	10.951	6.871		
2/ 1/101	9:57:00	11.449	6.484		
2/ 1/101	9:58:00	11.642	6.299		
2/ 1/101	9:59:00	12.154	5.916		
2/ 1/101	10:00:00	12.566	5.554		
2/ 1/101	10:01:00	10.903	7.365		
2/ 1/101	10:02:00	8.964	8.744		
2/ 1/101	10:03:00	9.559	8.092		
2/ 1/101	10:04:00	9.668	7.908		
2/ 1/101	10:05:00	10.545	7.141		
2/ 1/101	10:06:00	11.244	6.566		
2/ 1/101	10:07:00	11.936	6.043		
2/ 1/101	10:08:00	12.305	5.788		
2/ 1/101	10:09:00	12.52	5.593		
2/ 1/101	10:10:00	12.909		M26-3 Average	11.9
2/ 1/101	10:11:00	13.475	4.902		
2/ 1/101	10:12:00	9.177	8.761		
2/ 1/101	10:13:00	8.577	8.649		
2/ 1/101	10:14:00	9.085	8.282		
2/ 1/101	10:15:00	10.279	7.375		
2/ 1/101	10:16:00			Cal Check	
2/ 1/101 2/ 1/101	10:17:00				
2/ 1/101	10:18:00				
2/ 1/101	10:19:00 10:20:00				
2/ 1/101	10:20:00				
2/ 1/101	10:21:00				
2/ 1/101	10:23:00				
2/ 1/101	10:24:00				
2/ 1/101	10:25:00				
2/ 1/101	10:26:00				
2/ 1/101	10:27:00				
2/ 1/101	10:28:00				
2/ 1/101	10:29:00				
2/ 1/101	10:30:00				
2/ 1/101	10:31:00				
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Medical Waste Incinerator CEM Responses

Date	Time	O2	CO2
2/ 1/101	10:32:00		
2/ 1/101	10:33:00		
2/ 1/101	10:34:00		
2/ 1/101	10:35:00		
2/ 1/101	10:36:00		
2/ 1/101	10:37:00	12.878	10.19
2/ 1/101	10:38:00	15.437	8.115
2/ 1/101	10:39:00	11.785	6.203
2/ 1/101	10:40:00	12.042	6.019
2/ 1/101	10:41:00	12.564	5.612
2/ 1/101	10:42:00	12.63	5.56
2/ 1/101	10:43:00	13.289	5.076
2/ 1/101	10:44:00	10.305	7.95
2/ 1/101	10:45:00	8.945	8.683
2/ 1/101	10:46:00	9.727	7.897
2/ 1/101	10:47:00	10.6	7.177
2/ 1/101	10:48:00	11.646	6.379
2/ 1/101	10:49:00	12.215	5.94
2/ 1/101	10:50:00	12.597	5.642
2/ 1/101	10:51:00	12.665	5.577
2/ 1/101	10:52:00	12.924	5.355
2/ 1/101	10:53:00	13.463	4.988
2/ 1/101	10:54:00	9.969	8.326
2/ 1/101	10:55:00	9.096	8.671
2/ 1/101	10:56:00	10.469	7.507
2/ 1/101	10:57:00	11.319	6.751
2/ 1/101	10:58:00	12.158	6.073
2/ 1/101	10:59:00	12.506	5.768
2/ 1/101	11:00:00	12.869	5.43
2/ 1/101	11:01:00	13.481	4.946
2/ 1/101	11:02:00	13.759	4.688
2/ 1/101	11:03:00	13.836	4.641
2/ 1/101	11:04:00	10.62	7.743
2/ 1/101	11:05:00	6.191	10.729
2/ 1/101	11:06:00	10.01	7.683
2/ 1/101	11:07:00	11.518	6.523
2/ 1/101	11:08:00	12.299	5.897
2/ 1/101	11:09:00	12.537	5.683
2/ 1/101	11:10:00	12.884	5.396
2/ 1/101	11:11:00	13.218	5.137
2/ 1/101	11:12:00	13.494	4.911

Medical Waste Incinerator CEM Responses

Date	Time	O2	CO2	
2/ 1/101	11:13:00	13.805	4.689	
2/ 1/101	11:14:00	14.098	4.486	
2/ 1/101	11:15:00	13.186	5.444	
2/ 1/101	11:16:00	9.176	8.904	
2/ 1/101	11:17:00	11.267	6.771	
2/ 1/101	11:18:00	11.588	6.419	
2/ 1/101	11:19:00	12.523	5.703	
2/ 1/101	11:20:00	12.933	5.366	
2/ 1/101	11:21:00	13.341	5.052	
2/ 1/101	11:22:00	13.693	4.788	
2/ 1/101	11:23:00	13.854	4.649	
2/ 1/101	11:24:00	14.074	4.477	
2/ 1/101	11:25:00	14.241	4.344	
2/ 1/101	11:26:00	14.573	4.173	
2/ 1/101	11:27:00	9.687	8.461	
2/ 1/101	11:28:00	8.1	9.214	
2/ 1/101	11:29:00	9.455	8.134	
2/ 1/101	11:30:00	10.169	7.642	
2/ 1/101	11:31:00	11.088	6.935	
2/ 1/101	11:32:00	11.505	6.614	
2/ 1/101	11:33:00	11.613	6.505	
2/ 1/101	11:34:00	11.614	6.492	
2/ 1/101	11:35:00	11.974	6.215	
2/ 1/101	11:36:00	12.005	6.178	
2/ 1/101	11:37:00	12.393	5.877	
2/ 1/101	11:38:00	12.308	5.9	
2/ 1/101	11:39:00	12.506	5.751	
2/ 1/101	11:40:00	12.946	5.407	
2/ 1/101	11:41:00	13.334	5.102	
2/ 1/101	11:42:00	13.596	4.895	
2/ 1/101	11:43:00		C	al check
2/ 1/101	11:44:00		1	
2/ 1/101	11:45:00		.	
2/ 1/101 2/ 1/101	11:46:00			
2/ 1/101	11:47:00		l	
2/ 1/101	11:48:00			
2/ 1/101	11:49:00 11:50:00			
2/ 1/101	11:50:00			
2/ 1/101	11:51:00			
2/ 1/101	11:52:00			
2 1/101	11.55.00			

Medical Waste Incinerator CEM Responses

Date	Time	O2	CO2
2/ 1/101	11:54:00		9
2/ 1/101	11:55:00		
2/ 1/101	11:56:00		
2/ 1/101	11:57:00	•	
2/ 1/101	11:58:00		
2/ 1/101	11:59:00		
2/ 1/101	12:00:00	12.137	9.942
2/ 1/101	12:01:00	12.143	9.954
2/ 1/101	12:02:00	12.146	9.963
2/ 1/101	12:03:00	12.15	9.978
2/ 1/101	12:04:00	12.154	9.983
2/ 1/101	12:05:00	12.159	9.989
2/ 1/101	12:06:00	12.16	10.002
2/ 1/101	12:07:00	11.257	8.915
2/ 1/101	12:08:00	10.168	7.656
2/ 1/101	12:09:00	10.95	7.008
2/ 1/101	12:10:00	11.835	6.326
2/ 1/101	12:11:00	12.539	5.76
2/ 1/101	12:12:00	12.933	5.435
2/ 1/101	12:13:00	13.227	5.167
2/ 1/101	12:14:00	13.667	4.81
2/ 1/101	12:15:00	13.788	4.706
2/ 1/101	12:16:00	14.031	4.536
2/ 1/101	12:17:00	11.588	7.121
2/ 1/101	12:18:00	10.083	7.839
2/ 1/101	12:19:29	11.206	6.727
2/ 1/101	12:20:29	12.101	6.049
2/ 1/101	12:21:29	13.215	5.192
2/ 1/101	12:22:29	13.592	4.891
2/ 1/101	12:23:29	14.004	4.546
2/ 1/101	12:24:29	14.23	4.381
2/ 1/101	12:25:29	14.516	4.178
2/ 1/101	12:26:29	14.943	3.923
2/ 1/101	12:27:29	10.235	8.31
2/ 1/101	12:28:29	11.381	6.825
2/ 1/101 2/ 1/101	12:29:29	11.542	6.538
	12:30:29	11.738	6.358
2/ 1/101 2/ 1/101	12:31:29	12.576	5.688
	12:32:29	13.078	5.288
2/ 1/101	12:33:29	13.652	4.834

Medical Waste Incinerator CEM Responses

Date	Time	O2	CO2
2/ 1/101	12:34:29	13.947	4.603
2/ 1/101	12:35:29	14.347	4.323
2/ 1/101	12:36:29	14.64	4.091
2/ 1/101	12:37:29	14.511	4.325
2/ 1/101	12:38:29	9.614	8.613
2/ 1/101	12:39:29	9.201	8.442
2/ 1/101	12:40:29	9.453	8.197
2/ 1/101	12:41:29	10.643	7.267
2/ 1/101	12:42:29	11.428	6.624
2/ 1/101	12:43:29	11.791	6.321
2/ 1/101	12:44:29	12.191	6.02
2/ 1/101	12:45:29	12.961	5.435
2/ 1/101	12:46:29	13.6	4.94
2/ 1/101	12:47:29	13.781	4.746
2/ 1/101	12:48:29	14.249	4.423
2/ 1/101	12:49:29	14.535	4.212
2/ 1/101	12:50:29	14.724	4.071
2/ 1/101	12:51:29	14.934	3.898
2/ 1/101	12:52:29	14.969	3.842
2/ 1/101	12:53:29	14.979	3.871
2/ 1/101	12:54:29	12.102	6.74
2/ 1/101	12:55:29	7.532	9.453
2/ 1/101	12:56:29	6.595	10.288
2/ 1/101	12:57:29	9.149	8.485
2/ 1/101	12:58:29	11.267	6.889
2/ 1/101	12:59:29	11.513	6.646
2/ 1/101	13:00:29	11.824	6.325
2/ 1/101	13:01:29	11.852	6.281
2/ 1/101	13:02:29	12.271	5.962
2/ 1/101	13:03:29	12.545	5.801
2/ 1/101	13:04:29	7.915	9.943
2/ 1/101	13:05:29	7.933	9.476
2/ 1/101	13:06:29	10.095	7.887
2/ 1/101	13:07:29	11.466	6.831
2/ 1/101	13:08:29	12.128	6.236
2/ 1/101	13:09:29	12.243	6.052
2/ 1/101	13:10:29	12.46	5.851
2/ 1/101	13:11:29	12.75	5.625
2/ 1/101	13:12:29	13.198	5.272
2/ 1/101	13:13:29	13.126	5.316
2/ 1/101	13:14:29	13.437	5.067

Medical Waste Incinerator CEM Responses

Date	Time	O2	CO2
2/ 1/101	13:15:29	13.82	4.778
2/ 1/101	13:16:29	14.073	4.581
2/ 1/101	13:17:29	14.328	4.386
2/ 1/101	13:18:29	14.566	4.204
2/ 1/101	13:19:29	14.35	4.334
2/ 1/101	13:20:29	14.645	4.135
2/ 1/101	13:21:29	14.811	3.993
2/ 1/101	13:22:29	14.913	3.933
2/ 1/101	13:23:29	15.023	3.85
2/ 1/101	13:24:29	15.111	3.781
2/ 1/101	13:25:29	15.172	3.739
2/ 1/101	13:26:29	15.246	3.676
2/ 1/101	13:27:29	15.318	3.633
2/ 1/101	13:28:29	15.34	3.603
2/ 1/101	13:29:29	14.024	4.357
2/ 1/101	13:30:29	13.709	4.563
Average	M23-3	12.2	6.2

Medical Waste Incinerator CEM Responses

Date	Time	O2	CO2
31-Jan-01	10:45	12.0	5.6
31-Jan-01	10:46	12.5	5.6
31-Jan-01	10:47	12.5	4.8
31-Jan-01	10:48	13.0	4.8
31-Jan-01	10:49	13.3	4.0
31-Jan-01	10:50	13.5	8.8
31-Jan-01	10:51	9.3	8.0
31-Jan-01	10:52	9.5	8.0
31-Jan-01	10:53	10.0	7.2
31-Jan-01	10:54	11.3	5.2
31-Jan-01	10:55	12.8	4.8
31-Jan-01	10:56	13.0	4.8
31-Jan-01	10:57	8.8	8.0
31-Jan-01	10:58	9.8	8.4
31-Jan-01	10:59	10.8	8.8
31-Jan-01	11:00	10.8	8.8
31-Jan-01	11:01	12.0	8.4
31-Jan-01	11:02	12.8	8.0
31-Jan-01	11:03	13.3	8.0
31-Jan-01	11:04	13.5	7.2
31-Jan-01	11:05	13.8	6.8
31-Jan-01	11:06	14.0	6.4
31-Jan-01	11:07	14.0	6.0
31-Jan-01	11:08	15.0	5.6
31-Jan-01	11:09	10.3	5.2
31-Jan-01	11:10	11.0	4.8
31-Jan-01	11:11	9.3	5.2
31-Jan-01	11:12	11.8	5.6
31-Jan-01 31-Jan-01	11:13:15	10.055	5.659
31-Jan-01	11:14:15	10.784	5.529
	11:15:15	10.336	5.245
31-Jan-01 31-Jan-01	11:16:15	10.981	5.02
31-Jan-01	11:17:15 11:18:15	12.067	4.993
31-Jan-01	11:10:15	12.374	5.198
31-Jan-01	11:20:15	12.5	5.507
31-Jan-01		12.865	5.801
31-Jan-01	11:21:15	13.414	6.02
31-Jan-01	11:22:15 11:23:15	13.929	6.115
31-Jan-01	11:23:15	9.623	6.085
31-Jan-01	11:24:15	8.689	6.001
J I-Jail-U I	11.25.15	10.295	5.856

Medical Waste Incinerator CEM Responses

Date	Time	02	CO2
31-Jan-01	11:26:15	9.827	5.673
31-Jan-01	11:27:15	10.649	5.545
31-Jan-01	11:28:15	11.78	5.621
31-Jan-01	11:29:00	11	6
31-Jan-01	11:30:00	11.75	6
31-Jan-01	11:31:00	12.25	6.4
31-Jan-01	11:32:00	12.5	6.4
31-Jan-01	11:33:00	13	6.4
31-Jan-01	11:34:00	13.75	6.4
31-Jan-01	11:35:00	13.5	6.4
31-Jan-01	11:36:00	9.25	6.4
31-Jan-01	11:37:00	10	6.4
31-Jan-01	11:38:00	9.5	6
31-Jan-01	11:39:00	10.5	6.4
31-Jan-01	11:40:00	12	6.4
31-Jan-01	11:41:45	13.415	6.409
31-Jan-01	11:42:45	13.613	6.541
31-Jan-01	11:43:45	10.964	6.566
31-Jan-01	11:44:45	9.35	6.505
Average(11.7	6.2

Medical Waste Incinerator CEM Responses

Date	Time	02	CO2
2/ 1/101	9:10:00	12.832	5.33
2/ 1/101	9:11:00	13.373	4.869
2/ 1/101	9:12:00	13.966	4.419
2/ 1/101	9:13:00	14.29	4.17
2/ 1/101	9:14:00	14.513	3.989
2/ 1/101	9:15:00	13.408	4.554
2/ 1/101	9:16:00	13.451	4.574
2/ 1/101	9:17:00	10.678	7.566
2/ 1/101	9:18:00	9.866	7.777
2/ 1/101	9:19:00	9.84	7.612
2/ 1/101	9:20:00	10.2	7.443
2/ 1/101	9:21:00	12.279	5.749
2/ 1/101	9:22:00	12.997	5.158
2/ 1/101	9:23:00	13.609	4.676
2/ 1/101	9:24:00	13.882	4.425
2/ 1/101	9:25:00	13.991	4.314
2/ 1/101	9:26:00	14.214	4.142
2/ 1/101	9:27:00	14.517	3.902
2/ 1/101	9:28:00	13.94	4.221
2/ 1/101	9:29:00	13.846	4.275
2/ 1/101	9:30:00	14.453	3.941
2/ 1/101	9:31:00	10.26	7.872
2/ 1/101	9:32:00	9.142	8.036
2/ 1/101	9:33:00	8.592	8.282
2/ 1/101	9:34:00	10.308	7.231
2/ 1/101	9:35:00	12.22	5.866
2/ 1/101	9:36:00	12.845	5.333
2/ 1/101	9:37:00	13.379	4.882
2/ 1/101 2/ 1/101	9:38:00	13.968	4.387
2/ 1/101	9:39:00	14.439	4.032
2/ 1/101	9:40:00	14.248	4.416
2/ 1/101	9:41:00	10.234	7.878
2/ 1/101	9:42:00	11.043	6.824
2/ 1/101	9:43:00 9:44:00	9.472	7.999
2/ 1/101	9:44:00 9:45:00	10.376	7.322
2/ 1/101	9:46:00	11.534	6.376
2/ 1/101	9:47:00	12.437 13.16	5.668
2/ 1/101	9:48:00	13.16	5.079
2/ 1/101	9:49:00	14.316	4.721
	3.75.00	14.010	4.246

Medical Waste Incinerator CEM Responses

Date	Time	O2	CO2
2/ 1/101	9:50:00	10.638	7.819
2/ 1/101	9:51:00	10.535	7.33
2/ 1/101	9:52:00	8.936	8.458
2/ 1/101	9:53:00	8.673	8.738
2/ 1/101	9:54:00	10.017	7.619
2/ 1/101	9:55:00	10.574	7.152
2/ 1/101	9:56:00	10.951	6.871
2/ 1/101	9:57:00	11.449	6.484
2/ 1/101	9:58:00	11.642	6.299
2/ 1/101	9:59:00	12.154	5.916
2/ 1/101	10:00:00	12.566	5.554
2/ 1/101	10:01:00	10.903	7.365
2/ 1/101	10:02:00	8.964	8.744
2/ 1/101	10:03:00	9.559	8.092
2/ 1/101	10:04:00	9.668	7.908
2/ 1/101	10:05:00	10.545	7.141
2/ 1/101	10:06:00	11.244	6.566
2/ 1/101	10:07:00	11.936	6.043
2/ 1/101	10:08:00	12.305	5.788
2/ 1/101	10:09:00	12.52	5.593
Average		11.93	6.08

Medical Waste Incinerator CEM Responses

	_		
Date	Time	02	CO2
2-Feb-01	9:45:00	13.314	5.328
2-Feb-01	9:46:00	10.023	7.636
2-Feb-01	9:47:00	9.985	7.295
2-Feb-01	9:48:00	7.953	9.017
2-Feb-01	9:49:00	11.025	6.729
2-Feb-01	9:50:00	12.542	5.567
2-Feb-01	9:51:00	13.149	5.055
2-Feb-01	9:52:00	13.659	4.666
2-Feb-01	9:53:00	13.887	4.462
2-Feb-01	9:54:00	14.0	4.8
2-Feb-01	9:55:00	14.3	4.8
2-Feb-01	9:56:00	14.4	4.4
2-Feb-01	9:57:00	13.8	7.6
2-Feb-01	9:58:00	13.8	9.6
2-Feb-01	9:59:00	10.0	8.0
2-Feb-01	10:00:00	10.0	6.4
2-Feb-01	10:01:00	10.3	5.2
2-Feb-01	10:02:00	10.5	4.8
2-Feb-01	10:03:00	12.0	4.4
2-Feb-01	10:04:00	12.8	6.0
2-Feb-01	10:05:00	13.5	10.4
2-Feb-01	10:06:00	14.0	8.4
2-Feb-01	10:07:00	13.8	6.4
2-Feb-01	10:08:00	6.5	6.4
2-Feb-01	10:09:00	10.8	6.0
2-Feb-01	10:10:00	11.8	5.6
2-Feb-01	10:11:00	12.0	5.2
2-Feb-01	10:12:00	12.0	8.0
2-Feb-01	10:13:00	12.3	8.0
2-Feb-01	10:14:00	13.0	7.6
2-Feb-01	10:15:00	13.5	8.4
2-Feb-01	10:16:00	13.3	6.8
2-Feb-01	10:17:00	10.0	6.8
2-Feb-01	10:18:00	10.3	6.4
2-Feb-01	10:19:00	8.3	6.4
2-Feb-01	10:20:00	10.8	6.0
2-Feb-01	10:21:00	11.0	6.0
2-Feb-01	10:22:00	11.5	5.6
2-Feb-01 2-Feb-01	10:23:00	11.5	4.8
2-Feb-01	10:24:00	12.0	9.2

Medical Waste Incinerator CEM Responses

Date	Time	O2	CO2
2-Feb-01	10:25:00	12.3	7.2
2-Feb-01	10:26:00	12.5	8.0
2-Feb-01	10:27:00	8.3	7.2
2-Feb-01	10:28:00	9.8	5.2
2-Feb-01	10:29:00	9.5	4.8
2-Feb-01	10:30:00	10.3	8.8
2-Feb-01	10:31:00	11.0	9.6
2-Feb-01	10:32:00	12.5	8.8
2-Feb-01	10:33:00	8.5	8.0
2-Feb-01	10:34:00	6.8	6.8
2-Feb-01	10:35:00	9.0	6.0
2-Feb-01	10:36:00	10.0	5.6
2-Feb-01	10:37:00	11.0	5.2
2-Feb-01	10:38:50	9.142	8.334
2-Feb-01	10:39:50	10.356	7.383
2-Feb-01	10:40:50	11.154	6.732
2-Feb-01	10:41:50	11.859	6.201
2-Feb-01	10:42:50	12.379	5.83
2-Feb-01	10:43:50	12.548	5.689
2-Feb-01	10:44:50	12.721	5.542
2-Feb-01	10:45:50	12.999	5.308
2-Feb-01	10:46:50	13.341	5.033
2-Feb-01	10:47:50	13.797	4.686
2-Feb-01	10:48:50	13.441	5.162
2-Feb-01	10:49:50	9.002	8.805
2-Feb-01	10:50:50	7.876	9.207
Averge		11.43	6.59

Medical Waste Incinerator CEM Responses

M29-1

Date	Time	O2	CO2
2-Feb-01	9:45:00	13.314	5.328
2-Feb-01	9:46:00	10.023	7.636
2-Feb-01	9:47:00	9.985	7.030
2-Feb-01	9:48:00	7.953	9.017
2-Feb-01	9:49:00	11.025	6.729
2-Feb-01	9:50:00	12.542	5.567
2-Feb-01	9:51:00	13.149	5.055
2-Feb-01	9:52:00	13.659	4.666
2-Feb-01	9:53:00	13.887	4.462
2-Feb-01	9:54:00	14.0	4.8
2-Feb-01	9:55:00	14.3	4.8
2-Feb-01	9:56:00	14.4	4.4
2-Feb-01	9:57:00	13.8	7.6
2-Feb-01	9:58:00	13.8	9.6
2-Feb-01	9:59:00	10.0	8.0
2-Feb-01	10:00:00	- 10.0	6.4
2-Feb-01	10:01:00	10.3	5.2
2-Feb-01	10:02:00	10.5	4.8
2-Feb-01	10:03:00	12.0	4.4
2-Feb-01	10:04:00	12.8	6.0
2-Feb-01	10:05:00	13.5	10.4
2-Feb-01	10:06:00	14.0	8.4
2-Feb-01	10:07:00	13.8	6.4
2-Feb-01	10:08:00	6.5	6.4
2-Feb-01	10:09:00	10.8	6.0
2-Feb-01	10:10:00	11.8	5.6
2-Feb-01	10:11:00	12.0	5.2
2-Feb-01	10:12:00	12.0	8.0
2-Feb-01 2-Feb-01	10:13:00	12.3	8.0
_	10:14:00	13.0	7.6
2-Feb-01	10:15:00	13.5	8.4
2-Feb-01	10:16:00	13.3	6.8
2-Feb-01	10:17:00	10.0	6.8
2-Feb-01 2-Feb-01	10:18:00	10.3	6.4
2-Feb-01	10:19:00	8.3	6.4
2-Feb-01 2-Feb-01	10:20:00 10:21:00	10.8	6.0
2-Feb-01 2-Feb-01	10:21:00	11.0	6.0
2-Feb-01	10:22:00	11.5	5.6
2-Feb-01	10:23:00	11.5	4.8
2-1 60-01	10.24.00	12.0	9.2

Medical Waste Incinerator CEM Responses

Date	Time	O2	CO2
2-Feb-01	10:25:00	12.3	7.2
2-Feb-01	10:26:00	12.5	8.0
2-Feb-01	10:27:00	8.3	7.2
2-Feb-01	10:28:00	9.8	5.2
2-Feb-01	10:29:00	9.5	4.8
2-Feb-01	10:30:00	10.3	8.8
2-Feb-01	10:31:00	11.0	9.6
2-Feb-01	10:32:00	12.5	8.8
2-Feb-01	10:33:00	8.5	8.0
2-Feb-01	10:34:00	6.8	6.8
2-Feb-01	10:35:00	9.0	6.0
2-Feb-01	10:36:00	10.0	5.6
2-Feb-01	10:37:00	11.0	5.2
2-Feb-01	10:38:50	9.142	8.334
2-Feb-01	10:39:50	10.356	7.383
2-Feb-01	10:40:50	11.154	6.732
2-Feb-01	10:41:50	11.859	6.201
2-Feb-01	10:42:50	12.379	5.83
2-Feb-01	10:43:50	12.548	5.689
2-Feb-01	10:44:50	12.721	5.542
2-Feb-01	10:45:50	12.999	5.308
2-Feb-01	10:46:50	13.341	5.033
2-Feb-01	10:47:50	13.797	4.686
2-Feb-01	10:48:50	13.441	5.162
2-Feb-01	10:49:50	9.002	8.805
2-Feb-01	10:50:50	7.876	9.207
Average		11.4	6.6

Medical Waste Incinerator CEM Responses

Date	Time	O2	CO2
2/ 2/101	13:10:40	12.234	10.311
2/ 2/101	13:11:40	12.206	10.314
2/2/101	13:12:40	12.756	10.317
2/2/101	13:13:40	14.074	10.309
2/ 2/101	13:14:40	13.328	9.972
2/ 2/101	13:15:40	10.234	7.67
2/ 2/101	13:16:40	11.05	7.004
2/2/101	13:17:40	11.536	6.625
2/ 2/101	13:18:40	11.618	6.53
2/ 2/101	13:19:40	11.92	6.294
2/ 2/101	13:20:40	12.272	5.982
2/ 2/101	13:21:40	12.518	5.758
2/ 2/101	13:22:40	12.732	5.584
2/ 2/101	13:23:40	13.156	5.244
2/ 2/101	13:24:40	13.666	4.887
2/ 2/101	13:25:40	9.666	8.662
2/ 2/101	13:26:40	9.954	7.847
2/ 2/101	13:27:40	10.525	7.298
2/ 2/101	13:28:40	10.578	7.215
2/ 2/101	13:29:40	10.941	6.885
2/ 2/101	13:30:40	11.39	6.555
2/ 2/101	13:31:40	11.845	6.212
2/ 2/101	13:32:40	12.062	6.027
2/ 2/101	13:33:40	12.517	5.692
2/ 2/101	13:34:40	12.331	5.808
2/ 2/101	13:35:40	12.425	5.735
Average		11.9	7.2

Malcolm Grow Medical Center - Andrews AFB, MD Medical Waste Incinerator

CEM Responses

Date	Time	O2	CO2
2/ 2/101	14:05:40	11.067	6.854
2/2/101	14:06:40	12.001	6.139
2/ 2/101	14:07:40	12.618	5.666
2/2/101	14:08:40	12.799	5.49
2/2/101	14:09:40	12.477	5.712
2/2/101	14:10:40	13.105	5.259
2/2/101	14:11:40	13.592	4.935
2/2/101	14:12:40	9.819	8.358
2/2/101	14:13:40	8.463	9.02
2/2/101	14:14:40	9.677	8.046
2/2/101	14:15:40	10.817	7.177
2/2/101	14:16:40	12.037	6.247
2/2/101	14:17:40	12.796	5.649
2/2/101	14:18:40	13.024	5.44
2/2/101	14:19:40	13.155	5.3
2/2/101	14:20:40	13.629	4.916
2/ 2/101	14:21:40	14.112	4.56
2/ 2/101	14:22:40	14.351	4.379
2/2/101	14:23:40	14.475	4.27
2/2/101	14:24:40	14.376	4.313
2/2/101	14:25:40	14.53	4.196
2/ 2/101	14:26:40	14.627	4.109
2/2/101	14:27:40	14.71	4.045
2/2/101	14:28:40	14.759	4.007
2/2/101	14:29:40	14.893	3.932
2/ 2/101	14:30:40	10.106	8.306
2/2/101	14:31:40	8.54	9.271
2/ 2/101	14:32:40	11.493	6.733
2/ 2/101	14:33:40	12.352	5.993
2/ 2/101	14:34:40	12.726	5.615
2/ 2/101	14:35:40	13.453	5.064
2/ 2/101	14:36:40	13.989	4.628
2/ 2/101	14:37:40	14.408	4.314
2/ 2/101	14:38:40	14.506	4.2
2/ 2/101	14:39:40	14.414	4.437
2/ 2/101	14:40:40	9.517	8.583
2/ 2/101	14:41:40	9.219	8.215
2/ 2/101	14:42:40	9.438	7.957
2/ 2/101	14:43:40	11.199	6.607
2/ 2/101	14:44:40	12.119	5.929

Medical Waste Incinerator CEM Responses

Date	Time	O2	CO2
2/ 2/101	14:45:40	12.499	5.637
2/2/101	14:46:40	12.631	5.51
2/2/101	14:47:40	13.095	5.183
2/2/101	14:48:40	13.289	5.01
2/2/101	14:49:40	13.679	4.731
2/2/101	14:50:40	14.163	4.4
2/2/101	14:51:40	13.954	4.725
2/2/101	14:52:40	7.934	9.962
2/2/101	14:53:40	8.355	8.839
2/ 2/101	14:54:40	8.583	8.571
2/ 2/101	14:55:40	10.17	7.502
2/ 2/101	14:56:40	11.624	6.438
2/ 2/101	14:57:40	12.475	5.779
Average		12.3	6.0

Medical Waste Incinerator CEM Responses

					(A)_	
Date	Time	O2	CO2	NOx	СО	SO2
1-Feb-01	9:11:00	13.4	4.9	42.0	1.4	1.8
1-Feb-01	9:12:00	14.0	4.4	42.3	1.4	1.4
1-Feb-01	9:13:00	14.3	4.2	41.7	1.3	1.1
1-Feb-01	9:14:00	14.5	4.0	39.9	1.3	0.8
1-Feb-01	9:15:00	13.4	4.6	39.3	1.4	0.7
1-Feb-01	9:16:00	13.5	4.6	41.1	1.3	0.6
1-Feb-01	9:17:00	10.7	7.6	46.2	1.3	0.4
1-Feb-01	9:18:00	9.9	7.8	65.4	1.3	0.8
1-Feb-01	9:19:00	9.8	7.6	49.5	1.6	3.4
1-Feb-01	9:20:00	10.2	7.4	43.6	1.8	3.4
1-Feb-01	9:21:00	12.3	5.7	30.5	1.7	3.1
1-Feb-01	9:22:00	13.0	5.2	30.6	1.6	2.5
1-Feb-01	9:23:00	13.6	4.7	33.4	1.2	1.8
1-Feb-01	9:24:00	13.9	4.4	34.3	0.9	1.3
1-Feb-01	9:25:00	14.0	4.3	35.3	0.6	1.0
1-Feb-01	9:26:00	14.2	4.1	35.2	0.4	0.7
1-Feb-01	9:27:00	14.5	3.9	34.2	0.3	0.6
1-Feb-01	9:28:00	13.9	4.2	34.1	0.1	0.4
1-Feb-01	9:29:00	13.8	4.3	36.0	0.2	0.3
1-Feb-01	9:30:00	14.5	3.9	34.4	0.3	0.5
1-Feb-01	9:31:00	10.3	7.9	143.0	0.3	0.5
1-Feb-01	9:32:00	9.1	8.0	203.9	0.3	0.5
1-Feb-01	9:33:00	8.6	8.3	162.6	0.4	0.4
1-Feb-01	9:34:00	10.3	7.2	117.7	0.4	0.9
1-Feb-01	9:35:00	12.2	5.9	51.4	0.4	2.1
1-Feb-01	9:36:00	12.8	5.3	40.8	0.6	2.6
1-Feb-01	9:37:00	13.4	4.9	42.3	0.7	2.2
1-Feb-01	9:38:00	14.0	4.4	43.6	0.6	1.8
1-Feb-01	9:39:00	14.4	4.0	40.9	0.5	1.4
1-Feb-01	9:40:00	14.2	4.4	34.8	0.6	1.1
1-Feb-01	9:41:00	10.2	7.9	66.6	0.6	1.1
1-Feb-01	9:42:00	11.0	6.8	78.1	0.6	0.7
1-Feb-01	9:43:00	9.5	8.0	67.4	0.5	1.1
1-Feb-01	9:44:00	10.4	7.3	43.6	0.6	1.6
1-Feb-01	9:45:00	11.5	6.4	36.9	0.3	2.3
1-Feb-01	9:46:00	12.4	5.7	37.5	0.3	2.2
1-Feb-01	9:47:00	13.2	5.1	37.4	0.2	1.7
1-Feb-01	9:48:00	13.6	4.7		0.1	1.3
1-Feb-01	9:49:00	14.3	4.2		-0.1	1.1
1-Feb-01	9:50:00	10.6	7.8		-0.2	0.9
1-Feb-01	9:51:00	10.5	7.3	109.1	-0.3	8.0

Medical Waste Incinerator CEM Responses

Date	Time	O2	CO2	NOx	СО	SO2
1-Feb-01	9:52:00	8.9	8.5	137.7	-0.2	1.1
1-Feb-01	9:53:00	8.7	8.7	136.1	-0.1	1.8
1-Feb-01	9:54:00	10.0	7.6	106.0	-0.3	2.5
1-Feb-01	9:55:00	10.6	7.2	88.8	-0.3	2.9
1-Feb-01	9:56:00	11.0	6.9	76.1	-0.3	2.8
1-Feb-01	9:57:00	11.4	6.5	62.4	-0.1	2.4
1-Feb-01	9:58:00	11.6	6.3	52.1	0.1	2.2
1-Feb-01	9:59:00	12.2	5.9	42.1	0.2	1.9
1-Feb-01	10:00:00	12.6	5.6	39.8	0.4	1.6
1-Feb-01	10:01:00	10.9	7.4	55.9	0.3	1.4
1-Feb-01	10:02:00	9.0	8.7	106.2	0.0	1.4
1-Feb-01	10:03:00	9.6	8.1	116.8	-0.5	2.1
1-Feb-01	10:04:00	9.7	7.9	129.5	-0.8	3.7
1-Feb-01	10:05:00	10.5	7.1	103.4	-1.0	3.8
1-Feb-01	10:06:00	11.2	6.6	84.3	-0.9	3.3
1-Feb-01	10:07:00	11.9	6.0	57.1	-1.0	2.6
1-Feb-01	10:08:00	12.3	5.8	38.5	-0.8	2.2
1-Feb-01	10:09:00	12.5	5.6	43.0	-0.5	1.8
1-Feb-01	10:10:00	12.9	5.3	49.7	-0.5	1.6
Average		11.9	6.1	63.3	0.4	1.6

Medical Waste Incinerator CEM Responses

Run 2

Date	Time	O2	CO2	NOx	СО	SO2
1-Feb-01	10:42:00	12.6	5.6	49.3	0.7	2.8
1-Feb-01	10:43:00	13.3	5.1	50.1	0.0	2.6
1-Feb-01	10:44:00	10.3	8.0	67.3	-0.3	2.5
1-Feb-01	10:45:00	8.9	8.7	112.5	-0.2	2.7
1-Feb-01	10:46:00	9.7	7.9	98.7	-0.2	4.7
1-Feb-01	10:47:00	10.6	7.2	90.2	-0.4	4.6
1-Feb-01	10:48:00	11.6	6.4	68.9	-0.6	3.7
1-Feb-01	10:49:00	12.2	5.9	50.4	-0.6	3.2
1-Feb-01	10:50:00	12.6	5.6	36.3	-0.4	2.7
1-Feb-01	10:51:00	12.7	5.6	40.9	-0.4	2.4
1-Feb-01	10:52:00	12.9	5.4	44.4	-0.5	2.1
1-Feb-01	10:53:00	13.5	5.0	48.6	-0.6	2.0
1-Feb-01	10:54:00	10.0	8.3	75.4	-0.8	1.9
1-Feb-01	10:55:00	9.1	8.7	100.2	-0.9	2.0
1-Feb-01	10:56:00	10.5	7.5	89.2	-1.0	5.1
1-Feb-01	10:57:00	11.3	6.8	70.2	-0.9	5.5
1-Feb-01	10:58:00	12.2	6.1	48.1	-0.9	4.6
1-Feb-01	10:59:00	12.5	5.8	38.2	-0.7	3.8
1-Feb-01	11:00:00	12.9	5.4	43.1	-0.6	3.1
1-Feb-01	11:01:00	13.5	4.9	50.8	-0.7	2.7
1-Feb-01	11:02:00	13.8	4.7	50.8	-0.8	2.2
1-Feb-01	11:03:00	13.8	4.6	48.4	-1.0	2.0
1-Feb-01	11:04:00	10.6	7.7	66.6	-1.0	1.7
1-Feb-01	11:05:00	6.2	10.7	126.9	-0.9	2.6
1-Feb-01	11:06:00	10.0	7.7	102.4	-0.8	17.0
1-Feb-01	11:07:00	11.5	6.5	80.2	-0.8	15.1
1-Feb-01	11:08:00	12.3	5.9	51.6	-0.6	12.1
1-Feb-01	11:09:00	12.5	5.7	36.9	-0.2	10.0
1-Feb-01	11:10:00	12.9	5.4	36.1	0.2	8.3
1-Feb-01	11:11:00	13.2	5.1	39.9	0.2	6.7
1-Feb-01	11:12:00	13.5	4.9	44.9	-0.3	6.0
1-Feb-01	11:13:00	13.8	4.7	44.3	-0.8	5.1
1-Feb-01	11:14:00	14.1	4.5	43.8	-1.1	4.1
1-Feb-01	11:15:00	13.2	5.4	39.2	-1.2	3.2
1-Feb-01	11:16:00	9.2	8.9	180.0	-1.1	2.7
1-Feb-01	11:17:00	11.3	6.8	96.5	-1.0	2.8
1-Feb-01	11:18:00	11.6	6.4	57.3	-0.7	3.9
1-Feb-01	11:19:00	12.5	5.7	36.6	-0.4	3.9
1-Feb-01	11:20:00	12.9	5.4	38.0	-0.5	3.5
1-Feb-01	11:21:00	13.3	5.1	43.9	-0.6	3.2

Medical Waste Incinerator CEM Responses

Date	Time	O2	CO2	NOx	CO	SO2
1-Feb-01	11:22:00	13.7	4.8	42.8	-1.0	2.8
1-Feb-01	11:23:00	13.9	4.6	40.6	-1.0	2.4
1-Feb-01	11:24:00	14.1	4.5	40.9	-1.0	2.2
1-Feb-01	11:25:00	14.2	4.3	40.2	-1.0	2.0
1-Feb-01	11:26:00	14.6	4.2	38.7	-1.0	1.8
1-Feb-01	11:27:00	9.7	8.5	59.1	-1.0	1.6
1-Feb-01	11:28:00	8.1	9.2	113.0	-0.8	1.7
1-Feb-01	11:29:00	9.5	8.1	120.7	-0.9	5.6
1-Feb-01	11:30:00	10.2	7.6	114.8	-1.0	7.5
1-Feb-01	11:31:00	11.1	6.9	95.5	-1.0	7.1
1-Feb-01	11:32:00	11.5	6.6	79.9	-0.7	6.0
1-Feb-01	11:33:00	11.6	6.5	69.1	-0.3	4.7
1-Feb-01	11:34:00	11.6	6.5	60.2	0.2	3.9
1-Feb-01	11:35:00	12.0	6.2	49.3	0.8	3.6
1-Feb-01	11:36:00	12.0	6.2	41.3	1.2	3.4
1-Feb-01	11:37:00	12.4	5.9	39.3	1.1	3.2
1-Feb-01	11:38:00	12.3	5.9	43.5	0.6	2.9
1-Feb-01	11:39:00	12.5	5.8	45.4	0.0	2.6
1-Feb-01	11:40:00	12.9	5.4	45.1	-0.5	2.3
1-Feb-01	11:41:00	13.3	5.1	46.6	-0.8	2.0
Average		11.9	6.2	62.7	-0.5	4.2

Medical Waste Incinerator CEM Responses

Date	Time	O2	CO2	NOx	СО	SO2
2-Feb-01	9:48:00	8.0	9.0	90.0	-0.4	1.1
2-Feb-01	9:49:00	11.0	6.7	45.5	-0.4	1.6
2-Feb-01	9:50:00	12.5	5.6	39.6	-0.5	1.6
2-Feb-01	9:51:00	13.1	5.1	38.3	-0.6	1.4
2-Feb-01	9:52:00	13.7	4.7	36.8	-0.5	1.2
2-Feb-01	9:53:00	13.9	4.5	36.2	-0.5	1.0
2-Feb-01	9:54:00	14.0	4.8	40.0	0.0	1.0
2-Feb-01	9:55:00	14.3	4.8	40.0	0.0	1.0
2-Feb-01	9:56:00	14.4	4.4	35.0	0.0	1.0
2-Feb-01	9:57:00	13.8	7.6	55.0	0.0	2.0
2-Feb-01	9:58:00	13.8	9.6	75.0	0.0	2.0
2-Feb-01	9:59:00	10.0	8.0	90.0	0.0	2.0
2-Feb-01	10:00:00	10.0	6.4	70.0	0.0	1.5
2-Feb-01	10:01:00	10.3	5.2	50.0	0.0	1.5
2-Feb-01	10:02:00	10.5	4.8	35.0	0.0	1.5
2-Feb-01	10:03:00	· 12.0	4.4	40.0	0.0	1.5
2-Feb-01	10:04:00	12.8	6.0	45.0	0.0	1.5
2-Feb-01	10:05:00	13.5	10.4	40.0	0.0	1.5
2-Feb-01	10:06:00	14.0	8.4	35.0	0.0	1.5
2-Feb-01	10:07:00	13.8	6.4	105.0	0.0	1.5
2-Feb-01	10:08:00	6.5	6.4	110.0	0.0	1.5
2-Feb-01	10:09:00	10.8	6.0	100.0	0.0	1.5
2-Feb-01	10:10:00	11.8	5.6	60.0	0.0	1.5
2-Feb-01	10:11:00	12.0	5.2	55.0	0.0	1.5
2-Feb-01	10:12:00	12.0	8.0	45.0	0.0	1.5
2-Feb-01	10:13:00	12.3	8.0	40.0	0.0	1.5
2-Feb-01	10:14:00	13.0	7.6	40.0	0.0	1.5
2-Feb-01	10:15:00	13.5	8.4	40.0	0.0	1.5
2-Feb-01	10:16:00	13.3	6.8	35.0	0.0	1.5
2-Feb-01	10:17:00	10.0	6.8	100.0	0.0	1.5
2-Feb-01	10:18:00	10.3	6.4	100.0	0.0	2.0
2-Feb-01	10:19:00	8.3	6.4	95.0	0.0	2.0
2-Feb-01	10:20:00	10.8	6.0	95.0	0.0	2.0
2-Feb-01	10:21:00	11.0	6.0	80.0	0.0	2.0
2-Feb-01	10:22:00	11.5	5.6	45.0	0.0	2.0
2-Feb-01	10:23:00	11.5	4.8	40.0	0.0	2.0
2-Feb-01	10:24:00	12.0	9.2	45.0	0.0	1.5
2-Feb-01	10:25:00	12.3	7.2	50.0	0.0	1.5
2-Feb-01	10:26:00	12.5	8.0	50.0	0.0	1.5
2-Feb-01	10:27:00	8.3	7.2	150.0	0.0	1.0

Medical Waste Incinerator CEM Responses

Date	Time	O2	CO2	NOx	СО	SO2
2-Feb-01	10:28:00	9.8	5.2	200.0	0.0	2.0
2-Feb-01	10:29:00	9.5	4.8	135.0	0.0	3.0
2-Feb-01	10:30:00	10.3	8.8	125.0	0.0	3.0
2-Feb-01	10:31:00	11.0	9.6	85.0	0.0	2.5
2-Feb-01	10:32:00	12.5	8.8	65.0	0.0	2.0
2-Feb-01	10:33:00	8.5	8.0	50.0	0.5	1.5
2-Feb-01	10:34:00	6.8	6.8	35.0	1.0	1.5
2-Feb-01	10:35:00	9.0	6.0	40.0	0.5	1.0
2-Feb-01	10:36:00	10.0	5.6	40.0	0.0	2.0
2-Feb-01	10:37:00	11.0	5.2	145.0	0.0	2.0
2-Feb-01	10:38:50	9.1	8.3	120.4	-0.1	2.1
2-Feb-01	10:39:50	10.4	7.4	107.6	0.0	2.2
2-Feb-01	10:40:50	11.2	6.7	84.6	-0.2	2.1
2-Feb-01	10:41:50	11.9	6.2	63.3	-0.2	2.0
2-Feb-01	10:42:50	12.4	5.8	38.9	0.0	1.8
2-Feb-01	10:43:50	12.5	5.7	32.3	0.2	1.6
2-Feb-01	10:44:50	12.7	5.5	40.8	0.2	1.5
2-Feb-01	10:45:50	13.0	5.3	45.7	0.1	1.3
2-Feb-01	10:46:50	13.3	5.0	48.6	0.0	1.4
2-Feb-01	10:47:50	13.8	4.7	46.0	-0.2	1.3
Average		11.5	6.5	66.1	0.0	1.7

Medical Waste Incinerator

Oxygen Analyzer Drift Calculations and Gas Corrections

1-Feb-01

Calibration Gases	System Calibration
0.0 %	0.1
12.53 %	12.4
22.4 %	

Direct Calibration
0.0
12.5
22.5

Correlation	1.000000	
Slope 0.98164		
Intercept	0.100000	
Sampling Sy 0.40 0.40)%	

Correlation 0.99999		
Slope 1.004162		
Intercept -0.025126		
Calibration Error		
0.00%		
0.12%		
0.40%		

Pre Cal 0.1 12.4

Run 1	11.9	Corrected	12.0 % O₂
Post Cal	0.1	Drift	0.00%
	12.5		0.40%
Run 2	11.9	Corrected	12.2 % O ₂
Post Cal	0.10	Drift	0.00%
	12.10		1.60%

Medical Waste Incinerator

Oxygen Analyzer Drift Calculations and Gas Corrections

2-Feb-01

Calibration Gases	System Calibration
0.0 %	0.0
12.53 %	12.1
22.4 %	

Direct Calibration	
0.0	
12.5	
22.4	

Correlation 1.000000 Slope 0.965682 Intercept 0.000000 Sampling System Bias 0.00% 1.60%

Correlation 0.999999
Slope 0.999894
Intercept -0.008771

Calibration Error 0.00%
0.12%
0.00%

Pre Cal 0.0 12.1

Run 3	·11.5	Corrected	11.8 % O ₂
Post Cal	0.1	Drift	0.40%
	12.3		0.80%

Medical Waste Incinerator

Carbon Dioxide Analyzer Drift Calculations and Gas Corrections

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	Calibration Gases	System Calibration
	0.0 %	1.0
	10.04 %	10.1
1	22.4 %	

Direct Calibration	
0.0	
10.1	
22.4	

Correlation 1.000000
Slope 0.906375
Intercept 1.000000
Sampling System Bias
4.00%
0.00%

Correlation	0.999995		
Slope 0.99981			
Intercept 0.021993			
Calibration Error			
0.00%			
0.24%			
0.00%			

Pre Cal 0.0 10.1

Run 1	6.1	Corrected	6.0 % CO₂
Post Cal	0.1 10.2	Drift	0.40% 0.40%
Run 2	6.2	Corrected	6.1 % CO ₂
Post Cal	0.20 10.00	Drift	0.40% 0.80%

Medical Waste Incinerator

Carbon Dioxide Analyzer Drift Calculations and Gas Corrections

2-Feb-01

Calibration Gases	System Calibration
0.0 %	0.1
10.04 %	9.9
22.4 %	

Γ	Direct Calibration
	0.0
	10.1
	22.3

Correlation	1.000000
Slope	0.976096
Intercept	0.100000
Sampling Sy	
0.40)%
0.80)%

Correlation	0.999985	
Slope	0.995214	
Intercept	0.038422	
Calibration Error		
0.00%		
0.24%		
0.40%		

Pre Cal 0.1 9.9

Run 3	6.5	Corrected	6.5 % CO ₂
Post Cal	0.3 10.0	Drift	0.80% 0.40%

Medical Waste Incinerator

Nitrogen Oxides Analyzer Drift Calculations and Gas Corrections 1-Feb-01

Calibration Gases	System Calibration
0.0 ppm	-0.5
254.1 ppm	248.2
472.4 ppm	

Direct Calibration 0.2 252.7 472.9

Correlation 1.000000 Slope 0.978749 Intercept -0.500000 Sampling System Bias 0.14% 0.90% Correlation 0.999991
Slope 1.000447
Intercept -0.341592

Calibration Error
0.04%
0.28%
0.10%

Pre Cal -0.5 248.2

Run 1	63.3	Corrected	65.3 ppm NO _X
Post Cal	-0.4 247.4	Drift	0.02% 0.16%
Run 2	62.7	Corrected	62.4 ppm NO _X
Post Cal	4.90 249 30	Drift	1.06% 0.38%

Medical Waste Incinerator

Nitrogen Oxides Analyzer Drift Calculations and Gas Corrections 2-Feb-01

Calibration Gases	System Calibration
0.0 ppm	-0.1
254.1 ppm	249.9
472.4 ppm	

Direct Calibration
-0.4
472.3
253.5

Correlation 1.000000
Slope 0.983865
Intercept -0.100000
Sampling System Bias 0.06%
44.48%

Correlation 0.573006 Slope 0.573348 Intercept 102.9543 Calibration Error 0.08% 43.64% 43.78%

Pre Cal -0.1 249.9

Run 3	66.1	Corrected	67.6 ppm NO _X
Post Cal	-0.4 248.5	Drift	0.06% 0.28%

Medical Waste Incinerator

Carbon Monoxide Analyzer Drift Calculations and Gas Corrections 1-Feb-01

Calibration Gases	System Calibration
0.0 ppm	2.1
30.2 ppm	29.1
59.5 ppm	
89.7 ppm ·	·

Direct Calibration
-0.4
30.0
60.0
90.7

Correlation	1.000000	
Slope	0.894040	
Intercept	2.100000	
Sampling System Bias 2.50%		
0.90%		

Correlation	0.999995	
Slope	1.016406	
Intercept	-0.510816	
Calibration Error		
0.40%		
0.20%		
0.50%		
1.00%		

Pre Cal	2.1
	29.1

Run 1	0.4	Corrected	-0.8 ppm CO
Post Cal	0.1 26.5	Drift	2.00% 2.60%
Run 2	-0.5	Corrected	-0.7 ppm CO
Post Cal	0.10 26.50	Drift	0.00% 0.00%

Medical Waste Incinerator

Carbon Monoxide Analyzer Drift Calculations and Gas Corrections 2-Feb-01

Calibration Gases	System Calibration
0.0 ppm	-0.5
30.2 ppm	29.7
59.5 ppm	
89.7 ppm	

Direct Calibration	_
0.8	
30.7	
60.9	
90.9	

Correlation	1.000000
Slope	1.000000
Intercept	-0.500000
Sampling S 1.30 1.00	0%

0.99997		
1.006991		
0.661463		
Calibration Error		
0.80%		
0.50%		
1.40%		
1.20%		

Pre Cal -0.5 29.7

Run 3	0.0	Corrected	0.0 ppm CO
Post Cal	0.4	Drift	0.90%
	30.4		0.70%

Medical Waste Incinerator

Sulfur Dioxide Analyzer Drift Calculations and Gas Corrections 1-Feb-01

_		
I	Calibration Gases	System Calibration
1	0.0 ppm	2.1
1	45.1 ppm	41.2
١	91.7 ppm	

Direct Calibration
-0.2
44.9
92.1

Correlation 1.000000 Slope 0.866962 Intercept 2.100000 Sampling System Bias 2.30% 3.70%

Correlation	0.999993	
Slope	1.006578	
Intercept	-0.299964	
Calibration Error		
0.20%		
0.20%		
0.40%		

Pre Cal 2.1 41.2

Run 1	1.6	Corrected	-0.6 ppm SO ₂
Post Cal	2.2 41.0	Drift	0.10% 0.20%
Run 2	4.2	Corrected	2.1 ppm SO ₂
Post Cal	2.60 41.20	Drift	0.40% 0.20%

Medical Waste Incinerator

Sulfur Dioxide Analyzer Drift Calculations and Gas Corrections 2-Feb-01

Calibration Gases	System Calibration
0.0 ppm	3.0
45.1 ppm	41.3
91.7 ppm	

-	D: 10 III
	Direct Calibration
	0.1
	45.1
	91.5

Correlation	1.000000
Slope	0.849224
Intercept	3.000000
Sampling Sy 2.90 3.80)%

Correlation	1
Slope	0.996723
Intercept	0.116107
	ion Error 0%
0.0	0%
0.2	20%

Pre Cal 3.0 41.3

Run 3	1.7	Corrected	-2.0 ppm SO ₂
Post Cal	3.7 41.0	Drift	0.70% 0.30%

Appendix B.5

Raw Field Data

Visible Emissions (M9)

VISIBLE EMISSIONS EVALUATOR

This is to certify that

Bill Dunstan, Ir.

met the specifications of Federal Reference Method 9 and qualified as a visible emissions evaluator. Maximum deviation on white and black smoke did not exceed 7.5% opacity and no single error exceeding 15% opacity was incurred during the certification test conducted by Eastern Technical Associates of Raleigh, North Carolina. This certificate is valid for six months from date of issue.

281351

Springfield, Virginia

October 18, 2000

Certificate Number

Location

Date of Issue

President

Director of Training

6-MINUTE AVERAGES ANDREWS AFB, MD HOSPITAL INCINERATOR, BUILDING 1055

0	Total Avg.
0	24-30
0	18-24
0	12-18
0	6-12
0	0-6
average	interval
six-minute	six-minute
1440-1510	2/1/01, 1

Total Avg.	114-120	108-114	102-108	96-102	90-96	interval	six-minute	2/1/01, 1610-1640
0	0	0	0	0	0	average	six-minute	310-1640

Total Avg.	24-30	18-24	12-18	6-12	0-6	interval	six-minute	2/2/01, 9
0	0	0	0	0	0	average	six-minute	945-1015

Total Avg.

114-120

108-114

96-102 102-108

 \circ

six-minute six-minute

2/2/01, 1255-1325

interval

average

90-96

Total Avg.	54-60	48-54	42-48	36-42	30-36	six-minute interval	2/2/01, 10
0	0	0	0	0	0	six-minute average	1015-1045

six-minute six-minute

2/1/01, 1510-1540

interval

average

_									
	Total Avg.	144-150	138-144	132-138	126-132	120-126	interval	six-minute	2/2/01, 14
	0	0	0	0	0	0	average	six-minute	1405-1435

I	-1							S.	
	otal A	84-90	78-84	72-78	66-72	60-66	interva	six-minute	2/2/01
	Avg.						=		•
	0	0	0	0	0	0	average	six-minute	1225-1255

six-minute | six-minute

2/1/01, 1540-1610

interval

average

60-66

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0

Total Avg.

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66-72 72-78 78-84 84-90 Total Avg.

000

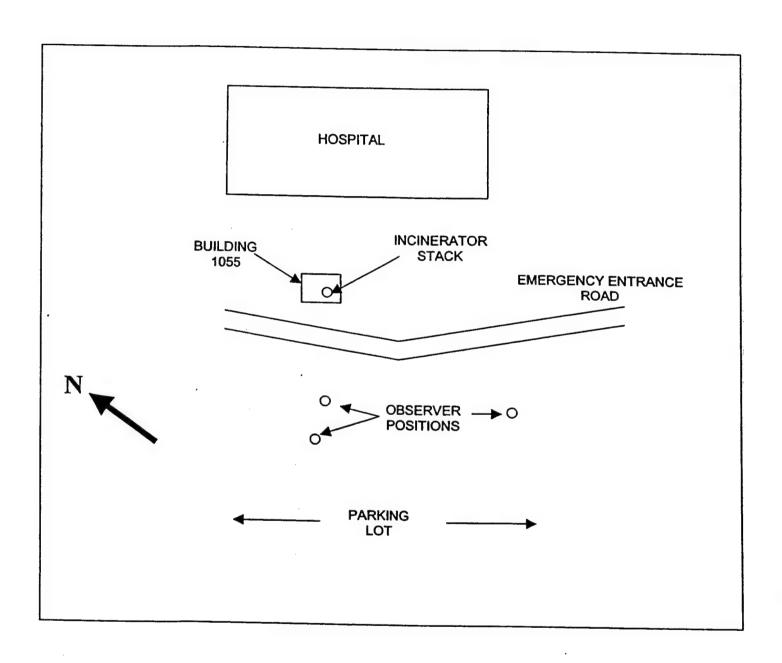
48-54 54-60

30-36 36-42 42-48

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Total Avg.	174-180	168-174	162-168	156-162	150-156	interval	six-minute	2/2/01, 14
0	0	0	0	0	0	average	six-minute	1435-1505

ANDREWS AFB, MD HOSPITAL WASTE INCINERATOR – BUILDING 1055



VISIBLE EMISSION OBSERVATION FORM 1

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Describe Emission Point	
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Start 30' End Sawe Start 25' End Sawe Distance to Emiss. Pt. Direction to Emiss. Pt. (Degrees)	_
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Vernical Angle to Obs. Pt. Start 20 End Sance Start Start 35 NE End Sance	
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Observers Name (Arm) Rill Dunstan Jr.	
Willian Dunstifr	2/1/01
Pairfix Environmental Services	
Eastern Technical Associates	10/18/00

'ISIBLE EMISSION OBSERVATION FORM 1

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Bill Duncton IV. William Dunstage	2/1/01
Pacific Environmental Services	
Eastern Technical Associates	10/18/00

VISIBLE EMISSION OBSERVATION FORM 1

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ISIBLE EMISSION OBSERVATION FORM 1

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stort 80' End Style	Start 3	8°NE	End Skime
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Commers Norma (Arri) Bill Dunstan Jr. Commers Sorices	
William Dunstedor.	2/1/01
Pacific Environmental Services	
Eastern Technical Associates	10/18/00

VISIBLE EMISSION OBSERVATION FORM 1

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teight of Erniss. Pt.					i, to Observer
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Sationce and Direct	ion to Observe	ation Point	from Emissi		ON DAME
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William Dunstafra	2/2/01
Priorition Priorition	
Eastern Technical Associates	10/18/2000

ISIBLE EMISSION OBSERVATION FORM

ISIBLE EMISSION O	R2FIK A	AHO	N FOI	5M 1
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Melhood 203A 2038	Other.			
ompany Name				
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Hospital Incine	ralor -	Bldg.	1055	
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Bill Dunstan IV. William Dieust Are	
Willian Dienster	2/2/01
Pacific Environmental Services	
Eastern Technical Associates	10/18/00

Additional Information

Longitude

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VISIBLE EMISSION OBSERVATION FORM 1

Method9	One) 203A	2038	Other	:	
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Н	ospital	Incine	rator -	Bldg.	1055
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Andrews	AFB		State M	D	Ζp
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ston 15 E				me	
Stort Nake (steam			(14.	
Ernesson Color	,,,,,,		Water Dro	CML plot Purno	<u> </u>
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Start Sky	okground ·		End S	den e	
Bockground Color	End Sav		Sky Cond	tions ;	
Wha Speed				ction	
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Stor 110	End Sa	me.			
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Observers Home (Print) Rill Duncton IV:	•
Bill Duncton In William Dunst fro	2/2/01
Pairfic Environmental Services	
Eastern Technical Associates	u/18/00

ISIBLE EMISSION OBSERVATION FORM 1

Methodo 203A	2038	Other		
Andrews	AFR			
Hospital I			Rida	1055
Oity Address			- J	
Andrews AFB		Note M	D	Дρ
waste incineration		Unit #	Operating	Mode
5 Crubber			Operating	Mode
Describe Emission Point Southern	nmost	stack		
eight of Erriss, Pt.		Height of E	rriss, Pt. Re	I. to Observer
Stort 30' End Same			o Emiss. Pt.	End Same (Degrees)
Vertical Angle to Obs. Pt.	L		0 Obs. Pl. (End Skime
Store 20 End Salut		Start 4	5 NE	End SAME
Not 15 C		End 8	me	
Promon Color		Water Dro	(M.E.	
Start End Sauce Describe Plume Background		Affached	Defe	oched None
Bockground Color		and S	ane Ions	·
Who speed Same Start 1-3 End Same		Stort D', 1 Who Direct	cloudy	End Same
Ambers Jemp.		Wet Bub T	emp.	RH Percent
So	urcelay	out Sketc	eh	Draw North Arrow
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×	Observati	ion Point		
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	Observer	i Paillan	-	Side View
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Sun Locali	on Line	**********		an +
Longitude Lott	lucie		Deci	nation
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Bill Duncton IK	
WINDAM DILUSTATOR	2/2/01
Pacific Environmental Services	
Eastern Technical Associates	Date (8/18/00

VISIBLE EMISSION OBSERVATION FORM 1

Mercoaltea (Orde One)	DOLK	AHONTORWIT
(Methodo 2004 2008	Other	
Company Name Andrews AFI	3	
Fooding Name Hospital Incine	erator -	RIda 1055
Street Address		131-131
Andrews AFB	Sicile M	
waste incineration	Unit #	Operating Mode
Contra Equipment Scrubber		Operating Mode
Descabe Emission Point		
swithernm	rost sta	ck
Height of Erriss, Pt.	Height of E	rriss. Pt. Rel. to Observer
Start 30 End Same Distance to Emiss. Pt.	Ston 2	2 End Same o Emiss. Pt. (Degrees)
son 80' and some	ston 30	NE and Same
Vertical Angle to Obs. Pt. Start 20° End Sake	la- 110	O Obs. Pt. (Degrees)
Distance and Direction to Observation Pointstant	from Emissi	on Point
Describe Emissons		
From NoMe (Steam)	Find 5	(M.L. pet Pume
Start End Salve Describe Purps Background	Affoched	Detached None
Start Sky Bocagraina Color	End S	ame
Stort blue and Same	Start C. C	cloudy for reme
Start 1-3 End Same	Start E	End Same
Ston 11'C End Same	Wei Bud	emp. RH Percent
Source Lo	yout Sketc	Drow North Arrow
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X Observe	Offices Davies	
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Observe	r's Position	Scin View
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Sun Location Line		an 💠
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Observer's Norma (Pitre) Bill Duncton IV		_
William Dunstide	2/2/01	
Pairfie Environmental Services		
Eastern Technical Associates	(2 18 00	

'ISIBLE EMISSION OBSERVATION FORM 1

Methodo 203A 203B	~				
2000	Othe	эг			
ompany Name					
FOORTY NOTICE AND APB					
Hospital Incin	erator-	- Bldg. 1055			
City A. A ASS	Sicile	Ap Dp			
THANKWI APB	Andrews AFB MD D				
TOC ess	Unit #	Operating Mode			
waste incineration					
Scrubber Operating Mode					
Describe Emisson Point					
Southern	most star	ck			
teight of Emiss. Pt.	Height of	Erriss, Pl. Rel. to Observer			
Start 35' End Same	Start _	5' Fred Same			
Dar 80' End Come	Start 3	10 Erniss, Pt. (Degrees)			
Vertical Angle to Obs. Pt.					
Stort 20' Fort Same	100 L	to Obs. Pt. (Degrees) 5° NE. Frod Case			
Distance and Direction to Observation Poin	from Emiss	ion Point			
	End &	rne			
Describe Errissons					
From Mone (steam)	End Same Water Dioplet Plume				
SON END SAME		Detached None			
Describe Pume Bookground					
son Sky	End S	ame			
BOCKGROUND COLOR STOR LY	Sky Cond	Hore			
Start SKY Bockground Color Start blue End Same What Speed	Start A Wind Dire	cloudy and same			
Start SKY Bockpround Color Start Nue End Seune What Speed Stort 1-3 End Seune Ambert lemp.	Stort A	cloudy and some			
Start Sky Bockpround Color Start blue End Same Who Speed Start 1-3 Foot Call a	Sky Cond Start A Wind Dire	cloudy and some			
Start SKY Bockpround Color Start blue End Seune What Speed Start -3 End Seune Ambert Hemp. Start / **L End Seune	Start A Wind Direction & Wind Direction & West Bulb	cloudy and same can be same for same same for same same same same same same same same			
Start SKY Bockground Color Start Live End Sevel Wind Speed Start 1-3 End Sevel Ambert lemp.	Start A Wind Direction & Wind Direction & West Bulb	ch Draw North Arrow			
Start SKY Bockground Color Start J. What Speed Start J. 3 End Same Ambert lemp. Start 1/1 End Same Source La	Sty Cond Start A C What Dire Start E Wet Bulb	ch Draw North Arrow			
Start SKY Bockpround Color Start blue End Seune What Speed Start -3 End Seune Ambert Hemp. Start / **L End Seune	Sty Cond Start A C What Dire Start E Wet Bulb	ch Draw North Arrow			
Start SKY Bockground Color Start J. What Speed Start J. 3 End Same Ambert lemp. Start 1/1 End Same Source La	Sty Cond Start A C What Dire Start E Wet Bulb	ch Draw North Arrow			
Start SKY Bockground Color Start J. What Speed Start J. 3 End Same Ambert lemp. Start 1/1 End Same Source La	Sty Cond Start A (What Direction Start E Wet Bulb	ch Draw North Arrow			
Start SKY Bockpround Color Start Mule End Same What Speed Start 1-3 End Same Ambert lemp. Start 11"L End Same Kost	Sty Cond Start A (What Direction Start E Wet Bulb	ch Draw North Arrow			
Start SKY Bockpround Color Start Mule End Same What Speed Start 1-3 End Same Ambert lemp. Start 11"L End Same Kost	Sty Cond Start A (What Direction Start E Wet Bulb	ch Draw North Arrow			
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Start SKY Bockpround Color Start Mule End Same What Speed Start 1-3 End Same Ambert lemp. Start 11"L End Same Kost	Sty Cond Start A (What Direction Start E Wet Bulb	ch Draw North Arrow			
Start SKY Bockpround Color Start Hull End Salme What Speed Stort 1-3 End Salme Ambert lemp. Stort 11"L End Salme X Observer	Sty Cond Start A (What Direction Start E Wet Bulb	Cloudy End State Cloudy End State Chord Find State Ch Drow North Arrow Ch Drow North Arrow Ch FEI			
Start SKY Bockpround Color Start Hull End Salme What Speed Stort 1-3 End Salme Ambert lemp. Stort 11"L End Salme X Observer	Sty Cond Start A (What Dire Start E Wet Bulb Tyout Sketa	Cloudy End State Cloudy End State End State Internet Percent Drow North Arrow ITN MN FET FET Soo Year Stock			
Start SKY Bockpround Color Start Hull End Salme What Speed Stort 1-3 End Salme Ambert lemp. Stort 11"L End Salme X Observer	Sty Cond Start A (What Dire Start E Wet Bulb Tyout Sketa	Scover			
Start SKY Bockpround Color Start Hull End Salme What Speed Stort 1-3 End Salme Ambert lemp. Stort 11"L End Salme X Observer	Sty Cond Start A (What Dire Start E Wet Bulb Tyout Sketa	FIET Scarce State FIET Scarce State FIET Scarce State FIET Scarce State Sta			
Start SKY Bockpround Color Start Hulle End SAME What Speed Start I - 3 End SAME Ambert Iemp. Start I I'll End SAME X Observe Laboration line Sun Location line	Sty Cond Start A (What Dire Start E Wet Bulb Tyout Sketa	Cloudy End State Charley End State Find State Internal Percent Draw North Arrow ITN MN FET Sche View Stack With Pume Sun Whod			
Start SKY Bockpround Color Start Hull End Saune What Speed Start 1-3 End Saune Ambert lemp. Start 1/°C End Saune X Observe Sun Location Line Sun Location Line	Sty Cond Start A (What Dire Start E Wet Bulb Tyout Sketa	Couly End Save Cloudy End Save Feet Feet Feet Sack With Pume San Draw Feet Feet Feet Feet Feet Feet Feet Fee			
Start SKY Bockpround Color Start Muse End Sauns What Speed Start 1-3 End Sauns Ambert lemp. Start 1/°C End Sauns X Observe Longitude Longitude	Sty Cond Start A (What Dire Start E Wet Bulb Tyout Sketa	Cloudy End State Charley End State Find State Internal Percent Draw North Arrow ITN MN FET Sche View Stack With Pume Sun Whod			
Start SKY Bockpround Color Start Muse End Seams What Speed Start 1-3 End Seams Ambert lemp. Start 1/12 End Same X Observe Laboration time Sun Location time	Sty Cond Start A (What Dire Start E Wet Bulb Tyout Sketa	Cloudy End State Charley End State Find State Internal Percent Draw North Arrow ITN MN FET Sche View Stack With Pume Sun Whod			
Start SKY Bockpround Color Start Muse End Saune What Speed Stort 1-3 End Saune Ambient lemp. Stort 1/1 End Saune X Observe Longitude Longitude	Sty Cond Start A (What Dire Start E Wet Bulb Tyout Sketa	Cloudy End State Charley End State Find State Internal Percent Draw North Arrow ITN MN FET Sche View Stack With Pume Sun Whod			

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Continued on VEO Form Number	 T		1	Г

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Observer's Name (Pint)	
Bill Dunstan IV. William Dunstafra	2/2/01
Pacific Environmental Services	
Eastern Technical Associates	Date 10/18/00

APPENDIX C ANALYTICAL DATA

Appendix C.1 Analytical Data Particulate Matter/Metals (M29) Hydrogen Chloride (M26)



Central Park West 5001 South Miami Boulevard, P.O. Box 12077 Research Triangle Park, North Carolina 27709-2077 (919) 941-0333 FAX: (919) 941-0234

SAMPLE ANALYSIS FORM FOR FILTERABLE PARTICULATE

Plant: Andrews AFB	MD Medica	al Waste Incinerator	Run ID:	M29-1		
Sample Location:	Incinerato	r Outlet				
Analytical Balance	S/P 182	Lab Relative Humidity: 30	O% Amb.	Temp.	75	

RINSE CONTAINER I	D: M29-1-	AR		Rin	nse Beaker ID	•	1
Lab Added Vol., ml	<u>75</u>	Densit	ty of	Acetone (ρ _a)	0.7848	g/ml	
Container Final Wt	<u>234.3</u>	Acetone Bl	ank (Concent (C _a)	0.00000084	g/g	ok
Container Initial Wt	<u>168.4</u>	Acetone Ri	nse V	/olume (V _{aw})	<u>159</u>	ml	_ 0
Net Volume Wt., g	65.9		W _a =	$= C_a V_{aw} \rho_a =$	0.00011	g	0.0001% ok
Weighing Date	2/8/01	Time 16	645	Gross Wt	108.8239	g	
Last Weighing Date	2/9/01	Time 09	910	Gross Wt	108.8237	g	
Average of	2 Consecu	tive Weighings	s Mee	eting Criteria	108.8238	g	
Blank Beaker ID	4	- Rinse	e Bea	aker Tare Wt	108.8209	g	
Acetone Volume, ml	<u>150.99</u>	- Ace	etone	Blank (Wa)	0.0001	_ g	
Acetone Residue, g	0.0001	Weight in Ac	etone	e Rinse (ma)	0.0028	g	
		= Weight in Ac	etone	e Rinse (ma)	2.79	mg	

FILTER SAMPLE ID: N	129-1-F			Filter/	Container ID	: 1	04-007
Weighing Date	2/6/01	Time	1700	Gross Wt	34.5242	g	
Last Weighing Date	2/7/01	Time	920	Gross Wt	34.5237	g	
Average of 2	Consecut	ive Weig	hings Me	eting Criteria	34.52395	g	
		- Filte	r & Conta	iner Tare Wt_	34.5204	_g	
		=	= Weight	on Filter (mf)	0.00355	g	
		:	= Weight	on Filter (mf)	3.55	mg	
) A / = : = != !	[:l/a= /ma \	0.55		
SUMMARY			vveignt	on Filter (m _f)	3.55	mg	
	+	Weight	in Aceton	e Rinse (ma)	2.79	mg	
		=	Total Pa	rticulate (mn)	6.34	mg	

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Signature of Analyst	Signature of Reviewer
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Central Park West 5001 South Miaml Boulevard, P.O. Box 12077 Research Triangle Park, North Carolina 27709-2077 (919) 941-0333 FAX: (919) 941-0234

SAMPLE ANALYSIS FORM FOR FILTERABLE PARTICULATE

Plant: Andrews AFB	MD Medical	Waste I	ncinerato	r	Run ID:	M29-2	
Sample Location:	Incinerator	Outlet					
Analytical Balance	S/P 182	Lab Rela	ative Hum	nidity: 30%	Amb.	Temp.	75
RINSE CONTAINER	ID: M29-2-	AR		Ri	nse Beaker ID		2
Lab Added Vol., ml	<u>75</u>		Density o	f Acetone (ρ _a)	0.7848	g/ml	
Container Final Wt	<u>252.4</u>	Aceto	ne Blank	Concent (C _a)	0.00000084	g/g	ok
Container Initial Wt	<u>167.9</u>	Aceto	ne Rinse	Volume (V _{aw})	182.7	mi	
Net Volume Wt., g	84.5		Wa	$= C_a V_{aw} \rho_a =$	0.00012	g	0.0001% ok
Weighing Date	2/8/01	Time	1645	Gross Wt	101.4551	g	
Last Weighing Date	2/9/01	Time	0910	Gross Wt	101.4551	g	
Average o	f 2 Consecu	tive Weig	hings Me	eting Criteria	101.4551	g	
Blank Beaker ID	4	-	Rinse Be	aker Tare Wt	101.4507	g	
Acetone Volume, ml	<u>150.99</u>		- Aceton	e Blank (Wa)_	0.0001	g	
Acetone Residue, g	<u>0.0001</u>	Weight	in Acetor	ne Rinse (ma)	0.0043	- g	
	=	Weight	in Acetor	e Rinse (ma)	4.28	mg	
FILTER SAMPLE ID:	M29-2-F			Filter	/Container ID:	104-	-003
Weighing Date	2/6/01	Time	1700	Gross Wt	34.9589	g	
Last Weighing Date	2/7/01	Time	920	Gross Wt	34.9585	g	
Average of	2 Consecut	ive Weig	hings Me	eting Criteria	34.9587	g	
		- Filte	r & Conta	niner Tare Wt_	34.888	_g	
		-	= Weight	on Filter (mf)	0.0707	g	
		:	= Weight	on Filter (mf)	70.7	mg	
SUMMARY			Weight	on Filter (m _f)	70.7	mg	
	+	Weight i	n Aceton	e Rinse (ma)	4.28	mg	
v1.0 10/15/00		=	Total Par	rticulate (mn)	75.0	mg	
	e of Analyst			Ci	an of Davids		
Olgrialui e	, or Arialyst			Signatu	re of Reviewer		

Signature of Reviewer



Central Park West 5001 South Miami Boulevard, P.O. Box 12077 Research Triangle Park, North Carolina 27709-2077 (919) 941-0333 FAX: (919) 941-0234

SAMPLE ANALYSIS FORM FOR FILTERABLE PARTICULATE

Plant: Andrews	s AFB MD) Medical V	Vaste Incinerator	Run ID:	M29-3	

Sample Location: Incinerator Outlet

Analytical Balance S/P 182 Lab Relative Humidity: 30% Amb. Temp. 75

RINSE CONTAINER I	D: M29-3-	AR		Rii	nse Beaker ID);	3
Lab Added Vol., ml	<u>75</u>		ensity o	f Acetone (ρ _a)	0.7848	g/ml	
Container Final Wt	<u>219.4</u>	Aceto	ne Blank	Concent (C _a)	0.00000084	g/g	ok
Container Initial Wt	<u>167.6</u>	Acetor	ne Rinse	Volume (V _{aw})	<u>141</u>	ml	
Net Volume Wt., g	51.8		W	$_{a} = C_{a} V_{aw} \rho_{a} =$	0.00009	g	0.0001% ok
Weighing Date	2/8/01	Time	1645	Gross Wt	105.0907	g	
Last Weighing Date	2/9/01	Time	0910	Gross Wt	105.0907	g	
Average of	2 Consecu	tive Weig	hings Me	eeting Criteria	105.0907	g	
Blank Beaker ID	4	- 1	Rinse Be	eaker Tare Wt	105.0856	g	m
Acetone Volume, ml	<u>150.99</u>		- Acetor	ne Blank (Wa)	0.00009	g	
Acetone Residue, g	<u>0.0001</u>	Weight	in Acetoi	ne Rinse (ma)	0.00501	g	
	=	= Weight	in Acetoi	ne Rinse (ma)	5.01	mg	

FILTER SAMPLE ID: N	/129-3-F			Filter/	Container II): 104-005	
Weighing Date	2/7/01	Time	0920	Gross Wt	35.1023	g	
Last Weighing Date	2 <i>[</i> 7 <i>[</i> 01	Time	1705	Gross Wt	35.1024	g	
Average of 2	Consecut	ive Weig	hings Mee	eting Criteria	35.10235	g	
		- Filte	er & Contai	iner Tare Wt_	35.0363	g	
		:	= Weight o	on Filter (mf)	0.06605	g	
			= Weight o	on Filter (mf)	66.05	mg	

SUMMARY	Weight on Filter (m _f)	66.05	mg
	+ Weight in Acetone Rinse (ma)	5.01	mg
	= Total Particulate (mn)	71.06	mg

v1.0 10/15/00

Signature of Analyst	Signature of Reviewer

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					A.	search Triangle Park	Research Triangle Park, North Carolina 27709-2077
/// PACIFIC ENVIR	PACIFIC ENVIRONMENTAL SERVICES, INC.	_0	L WEIGHT I	FINAL WEIGHT DATA SHEET		(919) 941	-0333 FAX: (919) 941-0234
Project Number:	F181.001	Plant:	Andrews AFB	 Plant: Andrews AFB Medical Waste Ininerator	 te Ininerator		 tem Weiahed
							11.17
Date		10/9/ a	10/9/2	70/6/2	2/4/01		
Time		1100	35	0420	1705		
Relative Humidity (%):	(%):	282	318	30	32.5		
Temperature (°F		78.8	シキ	4.44	75.7		
Standard Weight (g):	t (g):	140-8000	866564	94.996	50.000		
Analyst:		MON	wow	Imm	Jugur		
			W	WEIGHINGS			Average of
IN Nimber	Ci olamoo Pioid	164	Sud	3rd	ı	442	Consecutive
ייין אמוווספו	M70 1	24 < 159	20 67 96	50 <72	40.	Inc	Constant Wts
104 - 805	M79-3	35.1053	35.1031	\$5.1023	55.1024		
	2- PCM	34.9605	34 9539	34.9585			



Central Park West 5001 South Miami Boulevard, P.O. Box 12077 Research Triangle Park, North Carolina 27709-2077 (919) 941-0333 FAX: (919) 941-0234

Method 5 Tare Weights

F181.00T		,			Item Weighed:	hed:	Beakers			
10/6/2	기	2	13/01							
0250			705							
3		-	325							
77.4			8:8							
160.0002			100.00d							
MAM			MOW							Average Filter
		_							Difference	Difference Tare Weight(s)
Field Sample ID No. 1st			Snd	3rd	4th	5th	eth	7th	(ma)	(mn)
	+	100	108.6211					T	0	/8
	10	101	4508						C	
M29-3 105.089	4	(0,	F.0857						0	
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METHOD 5 TARE WEIGHT

Item Weighed:

Project Number: 5-181-00

Date		11/1/10							
R.H. (%)		2000							
Temp. (.F)		71.9	71.9						
Std. Wt.		10.001	-						
Analyst		חסט	1309						
TO Number	Pield Sample						Final	Tare	Difference
100-170	107	10.	DU7	3rd	4th	5th	Wt. (g)	Wt. (g)	(mg)
3		35.85.21	35.827				•		
600- 401		35.0533	35.0525						
104-003	M29-2	34.8880							
104-004		35.5645	\$5.5645						
200-401	M29-3	35.0363	35.036.5						
200-601		36.0069	36.0069						
10%-007	17- PZW	34.5004	34.500%						
B00-100		357565							
		•							
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								7	1

PACIFIC ENVIRONMENTAL SERVICES, INC.

First Analytical Laboratories ANALYSIS REPORT

Method 29: Multi-Metals Method 26A: HCl

Project # 104-01-0048

Prepared for:

Pacific Environmental Services, Inc. 5001 South Miami Blvd. Research Triangle Park, NC 27709

Reviewed and Approved by:

William H. Wadlin, Ph. D.
Laboratory Manager

February 19, 2001

First Analytical Laboratories

CASE NARRATIVE

Project #: 10204

Report Date: 19-Feb-01

Client: Pacific Environmental Services

Client Project ID: 101-01-0048

Samples:

Four sets of Method 29 Multi-Metals Trains were submitted, one of which was the blank set. The elements of interest were cadmium, lead and mercury. In addition, four samples were submitted for determination of HCl by Method 26A. All of the samples were hand delivered in good condition, with no apparent leakage or damage.

Preparation:

The metals samples were all prepared and analyzed according to EPA Method 29, Determination of Metals Emissions from Stationary Sources. The Method 26A samples did not require any sample preparation.

Analysis:

Cadmium and lead were determined by Graphite Furnace Atomic Absorption Spectrophotometry (GFAA). Mercury was determined by Cold Vapor Atomic Absorption Spectrophotometry (CVAA). HCl was determined as chloride by Ion Chromatography with conductivity detection (IC).

Results:

The metals results are presented as total micrograms of element found in the whole analytical fraction listed, for each such fraction specified in the method. The HCl results are given as total milligrams present in the whole original sample. All of the target elements were measurable in all of the runs. The highest levels found were for lead, at about 500 μ g per run. The mercury levels found decreased exponentially with run number from about 73 μ g to 0.6 μ g.

Quality Control:

None of the target elements were found in the blanks. All of the spike recoveries were within the normal range of 75% to 125%. All of the samples were analyzed in duplicate. Whenever the sample levels were at least five times the detection limit, the duplicates agreed within the normal range of 20%.

5001 South Miami Boulevard, P.O. Box 12 Research Triangle Park, North Carolina 27709-2 (919) 941-0333 FAX: (919) 941-0

Chain of Custody Record

Time	Project Num		Driver Name						
Title		200 000		A LANGE OF THE PARTY OF THE PAR			Analysis Reguest		
Time	ł	100.101		Andrews AFB Medical Waste Incinerator					
Time Field Sample Description Time Field Sample Description Time Field Sample Description Time Field Sample Description Time Field Sample Description Time Field Sample Time Field Sample Time Field Sample Time Time Field Sample Time									
Time Field Sample ID Sample Description QS QB Contents of Imps. 1-3 and 0.1 N HNO, Rinse Contents of Imps. 5-6, KMnO, and DI Rinses Contents of Imps. 1-3 and 0.1 N HNO, Rinse Contents of Imps. 1-3 and 0.1 N HNO, Rinse Contents of Imps. 5-6, KMnO, and DI Rinses Contents of Imps. 5-6, KMnO, and DI Rinses Contents of Imps. 5-6, KMnO, and DI Rinses Contents of Imps. 5-6, KMnO, and 0.1 N HNO, Rinse Contents of Imps. 5-6, KMnO, and 0.1 N HNO, Rinse Contents of Imps. 5-6, KMnO, and 0.1 N HNO, Rinse Contents of Imps. 5-6, KMnO, and 0.1 N HNO, Rinse Contents of Imps. 5-6, KMnO, and 0.1 N HNO, Rinse Contents of Imps. 5-6, KMnO, and 0.1 N HNO, Rinse Contents of Imps. 5-6, KMnO, and 0.1 N HNO, Rinse Contents of Imps. 5-6, KMnO, and 0.1 N HNO, Rinse Contents of Imps. 5-6, KMnO, and 0.1 N HNO, Rinse Contents of Imps. 5-6, KMnO, and 0.1 N HNO, Rinse Contents of Imps. 5-6, KMnO, and 0.1 N HNO, Rinse Contents of Imps. 5-6, KMnO, and 0.1 N HNO, Rinse Contents of Imps. 5-6, KMnO, and 0.1 N HNO, Rinse C		DO Holzschy	h, J Falank, MD Maret						Remarks
0.945 M/29-1-1 Filler, dry 0.945 M/29-1-2 Front Half Acetone Dry-down residue / / / / / / / / / / / / / / / / / / /	Date	Time	Field Sample ID	Sample Description	PO	qd	6н		
1 0945 M29-1-2 Front Half Acetone Dry-down residue / / / / 1 0945 M29-1-3 0.1 N HNO, Front Half rinse / / / / 1 0945 M29-1-4 Contents of Imps. 1-3 and 0.1 N HNO, Rinse / / / / 1 0945 M29-1-5A Contents of Imps. 5-6 KMnO, and DI Rinses / / / / 1 0945 M29-1-5B Contents of Imps. 5-6, KMnO, and DI Rinses / / / / 1 0345 M29-1-5C Imps. 5-6 BN HCI Rinse / / / / 1 1230 M29-2-3 Front Half Acetone Dry-down residue / / / / 1 230 M29-2-3 Confents of Imps. 1-3 and 0.1 N HNO, Rinse / / / / 1 230 M29-2-4 Confents of Imps. 5-6, KMnO, and DI Rinses / / / / 1 230 M29-2-5 Confents of Imps. 5-6, KMnO, and DI Rinses / / / / / 1 230 M29-2-5 Front Half Tinse / / / / / 1 230 M29-2-5 Confents of Imps. 5-6, KMnO, and DI Rinses / / / / / / 1 230 M29-2-5 Front Half Acetone Dry-down residue / / / / / / / 1 230 M29-3-5 Front Half Acetone Dry-down residue / / / / / / / / 1 2405 M29-3-3 O. 1 N HNO,	2/2/01	0945	M29-1-1	Filler, dry	5	5	`	L	
1 0945 MZ9-1-3 0.1 N HNO, Front Half rinse / / / 1 0945 MZ9-1-4 Contents of Imps. 1-3 and 0.1 N HNO, Rinse / / / 1 0945 MZ9-1-5A Contents of Imps. 5-6, KMnO, and DI Rinses / / / 1 0945 MZ9-1-5B Contents of Imps. 5-6, KMnO, and DI Rinses / / / 1 0945 MZ9-1-5C Imps. 5-6 8N HCI Rinse / / / 1 1230 MZ9-2-1 Filler, dry / / / 1 1230 MZ9-2-2 Front Half Acetone Dry-down residue / / / 1 1230 MZ9-2-3 0.1 N HNO, Front Half rinse / / / 1 1230 MZ9-2-5A Contents of Imps. 5-6, KMnO, and DI Rinses / / / 1 1230 MZ9-2-5A Contents of Imps. 5-6, KMnO, and O.1 N HNO, Rinse / / / 1 1240 MZ9-2-5B Contents of Imps. 1-3 and 0.1 N HNO, Rinse / / / 1 1250 MZ9-3-5C Front Half Front Half rinse / / / 1 1250 MZ9-3-5A Contents of Imps. 5-6, KMnO, and O.1 N HNO, Rinse / / / 1 1250 MZ9-3-5A Contents of Imps. 5-6, KMnO, and O.1 N HNO, Rinse / / / <td>2/2/01</td> <td>0945</td> <td>M29-1-2</td> <td>Front Half Acetone Dry-down residue</td> <td>></td> <td>\</td> <td> </td> <td></td> <td>Beaker No. 1</td>	2/2/01	0945	M29-1-2	Front Half Acetone Dry-down residue	>	\			Beaker No. 1
0945 M29-14 Contents of Imps. 1-3 and 0.1 N HNO, Rinse / / / / 0945 M29-1-5A Contents of Imps. 5-6, KMnO, and DI Rinses / / / / 0945 M29-1-5B Contents of Imps. 5-6, RMnO, and DI Rinses / / / / 1230 M29-2-1 Filter, dry / / / / 1230 M29-2-3 0.1 N HNO, Front Half rinse / / / / 1230 M29-2-4 Contents of Imps. 1-3 and 0.1 N HNO, Rinse / / / / 1230 M29-2-4 Contents of Imps. 5-6, KMnO, and DI Rinses / / / / 1230 M29-2-5A Contents of Imps. 5-6, KMnO, and DI Rinses / / / / 1230 M29-2-5B Contents of Imps. 5-6, KMnO, and DI Rinses / / / / 1230 M29-2-5B Contents of Imps. 1-3 and 0.1 N HNO, Rinse / / / / 1405 M29-3-5 Front Half Acetone Dry-down residue / / / / / 1405 M29-3-5 Front Half Acetone Dry-down residue / / / / 1405 M29-3-5 Front Half Acetone Dry-down residue / / / / 1405 M29-3-5 Contents of Imps. 1-3 and 0.1 N HNO, Rinse / / / /	2/2/01	0945	M29-1-3	0.1 N HNO ₃ Front Half rinse	>	\	,		
0945 M29-1-5A Contents of Imps 4 and 0.1 N HNO ₃ Rinse / / 1 0945 M29-1-5B Contents of Imps 5-6, KMnO ₄ and DI Rinses / / / 1 0945 M29-1-5C Imps. 5-6 BN HCI Rinse / / / 1 230 M29-2-1 Filler, dry / / / / 1 230 M29-2-2 Front Half Acetone Dry-down residue / / / / 1 230 M29-2-4 Confents of Imps. 1-3 and 0.1 N HNO ₃ Rinse /<	2/2/01	0945	M29-1-4	Contents of Imps. 1-3 and 0.1 N HNO ₃ Rinse		-		_	
0945 M29-1-5B Contents of Imps. 5-6, KMnO ₄ and DI Rinses / / 1230 M29-2-1 Filter, dry / / / / 1230 M29-2-2 Front Half Acetone Dry-down residue / / / / 1230 M29-2-3 0.1 N HNO ₅ Front Half rinse / / / / / 1230 M29-2-4 Contents of Imps. 1-3 and 0.1 N HNO ₅ Rinse /	2/2/01	0945	M29-1-5A	Conlents of Imp 4 and 0.1 N HNO ₃ Rinse	5	\	\ \		
0945 M29-1-5C Imps. 5-6 8N HCI Rinse / / / / 1230 M29-2-1 Filter, dry / / / / 1230 M29-2-2 Front Half Acetone Dry-down residue / / / / 1230 M29-2-3 0.1 N HNO ₃ Front Half rinse / / / / 1230 M29-2-4 Confents of Imps. 1-3 and 0.1 N HNO ₃ Rinse / / / / 1230 M29-2-5A Contents of Imps. 5-6, KMnO ₄ and DI Rinses / / / / 1230 M29-2-5C Imps. 5-6 8N HCI Rinse / / / / 1405 M29-3-3 Finet Half Acetone Dry-down residue / / / / 1405 M29-3-3 D.1 N HNO ₃ Front Half rinse / / / / 1405 M29-3-3 D.1 N HNO ₃ Front Half rinse / / / / 1405 M29-3-5 Contents of Imps. 1-3 and 0.1 N HNO ₃ Rinse / / / / 1405 M29-3-5 Contents of Imps. 5-6, KMnO ₄ and DI Rinses / / / / 1405 M29-3-5 Contents of Imps. 5-6, KMnO ₄ and DI Rinses / / / /	2/2/01	0945	M29-1-5B	Contents of Imps. 5-6, KMnO, and DI Rinses	L	>	\ \		
1230 M29-2-1 Filter, dry 1230 M29-2-2 Front Half Acetone Dry-down residue 1230 M29-2-3 0.1 N HNO ₃ Front Half rinse 1230 M29-2-4 Contents of Imps 1-3 and 0.1 N HNO ₃ Rinse 1230 M29-2-5A Contents of Imps 5-6, KMnO ₄ and DI Rinses 1230 M29-2-5B Contents of Imps 5-6, KMnO ₄ and DI Rinses 1230 M29-2-5C Imps 5-6 8N HCI Rinse 1230 M29-2-5C Imps 5-6 8N HCI Rinse 1405 M29-3-3 Front Half rinse 1405 M29-3-3 0.1 N HNO ₃ Front Half rinse 1405 M29-3-3 0.1 N HNO ₃ Front Half rinse 1405 M29-3-5A Contents of Imps 1-3 and 0.1 N HNO ₃ Rinse 1405 M29-3-5A Contents of Imps 5-6, KMnO ₄ and DI Rinses 1405 M29-3-5C Imps 5-6 8N HCI Rinse	2/2/01	0945	M29-1-5C	Imps. 5-6 8N HC! Rinse	>	\	`	_	
1230 M29-2-2 Front Half Acetone Dry-down residue / / / / / / 1230 M29-2-3 0.1 N HNO ₃ Front Half rinse / / / / / 1230 M29-2-4 Confents of Imps. 1-3 and 0.1 N HNO ₃ Rinse / / / / / 1230 M29-2-5A Confents of Imp 4 and 0.1 N HNO ₃ Rinse / / / / / 1230 M29-2-5B Confents of Imp 5-6, KMnO ₄ and DI Rinses / / / / / 1405 M29-3-1 Filter, dry / / / / / 1405 M29-3-2 Front Half Acetone Dry-down residue / / / / / 1405 M29-3-3 0.1 N HNO ₃ Front Half rinse / / / / / / 1405 M29-3-4 Contents of Imps. 1-3 and 0.1 N HNO ₃ Rinse / / / / / / 1405 M29-3-5A Contents of Imps. 5-6, KMnO ₄ and DI Rinses / / / / / / 1405 M29-3-5A Contents of Imps. 5-6, RMnO ₄ and DI Rinses / / / / / / 1405 M29-3-5C Imps. 5-6 8N HCI Rinse / / / / / / /	2/2/01	1230	M29-2-1	Filler, dry	>	>	`		
1230 M29-2-3 0.1 N HNO ₃ Front Half rinse / / / / 1230 M29-2-4 Contents of Imps. 1-3 and 0.1 N HNO ₃ Rinse / / / / 1230 M29-2-5A Contents of Imps. 5-6, KMnO ₄ and DI Rinses / / / / 1230 M29-2-5B Contents of Imps. 5-6 8N HCI Rinse / / / / 1405 M29-3-1 Filter, dry / / / / 1405 M29-3-2 Front Half Acetone Dry-down residue / / / / 1405 M29-3-3 D.1 N HNO ₃ Front Half rinse / / / / 1405 M29-3-4 Contents of Imps. 1-3 and 0.1 N HNO ₃ Rinse / / / / 1405 M29-3-5A Contents of Imp 4 and 0.1 N HNO ₃ Rinse / / / / 1405 M29-3-5B Contents of Imp 4 and 0.1 N HNO ₃ Rinses / / / / 1405 M29-3-5C Imps. 5-6 8N HCI Rinse / / / /	2/2/01	1230	M29-2-2	Front Half Acetone Dry-down residue	`	>			Beaker No. 2
1230 M29-2-4 Contents of Imps. 1-3 and 0.1 N HNO ₃ Rinse / / / 1230 M29-2-5A Contents of Imp 4 and 0.1 N HNO ₃ Rinse / / / 1230 M29-2-5B Contents of Imps. 5-6 KMnO ₄ and DI Rinses / / / 1230 M29-2-5C Imps. 5-6 8N HCI Rinse / / / 1405 M29-3-1 Filter, dry / / / 1405 M29-3-2 Front Half Acetone Dry-down residue / / / 1405 M29-3-3 0.1 N HNO ₃ Front Half rinse / / / 1405 M29-3-4 Contents of Imps. 1-3 and 0.1 N HNO ₃ Rinse / / / 1405 M29-3-5A Contents of Imp 4 and 0.1 N HNO ₃ Rinse / / / 1405 M29-3-5A Contents of Imps. 5-6, KMnO ₄ and DI Rinses / / / 1405 M29-3-5C Imps. 5-6 8N HCI Rinse / / /	272/01	1230	M29-2-3	0.1 N HNO ₃ Front Half rinse	>	>	\ \		
1230 M29-2-5A Contents of Imp 4 and 0.1 N HNO ₃ Rinse / / / / 1230 M29-2-5B Contents of Imps. 5-6, KMnO ₄ and DI Rinses / / / / 1230 M29-2-5C Imps. 5-6 8N HCI Rinse / / / / 1405 M29-3-1 Filter, dry / / / / 1405 M29-3-2 Front Half Acetone Dry-down residue / / / / 1405 M29-3-3 0.1 N HNO ₃ Front Half rinse / / / / 1405 M29-3-3 0.1 N HNO ₃ Front Half rinse / / / / 1405 M29-3-5A Contents of Imps. 1-3 and 0.1 N HNO ₃ Rinse / / / / 1405 M29-3-5B Contents of Imps. 5-6, KMnO ₄ and DI Rinses / / / / 1405 M29-3-5C Imps. 5-6 8N HCI Rinse / / / /	2/2/01	1230	M29-2-4	Contents of Imps. 1-3 and 0.1 N HNO3 Rinse	>	\	\ \		
1230 M29-2-5B Contents of Imps. 5-6, KMnO ₄ and DI Rinses /	2/2/01	1230	M29-2-5A	Contents of Imp 4 and 0.1 N HNO ₃ Rinse	`	>	\	-	
1230 M29-2-5C Imps. 5-6 8N HCl Rinse / / / / 1405 M29-3-1 Filter, dry / / / / 1405 M29-3-2 Front Half Acetone Dry-down residue / / / / 1405 M29-3-3 0.1 N HNO ₃ Front Half rinse / / / / 1405 M29-3-5A Contents of Imps. 1-3 and 0.1 N HNO ₃ Rinse / / / / 1405 M29-3-5A Contents of Imps. 5-6, KMnO ₄ and DI Rinses / / / / 1405 M29-3-5C Imps. 5-6 8N HCl Rinse / / / /	2/2/01	1230	M29-2-5B	Contents of Imps. 5-6, KMnO, and DI Rinses	`	>	\ \		
1405 M29-3-1 Filter, dry / / / / 1405 M29-3-2 Front Half Acetone Dry-down residue / / / / 1405 M29-3-3 0.1 N HNO ₃ Front Half rinse / / / / 1405 M29-3-4 Contents of Imps. 1-3 and 0.1 N HNO ₃ Rinse / / / / 1405 M29-3-5A Contents of Imps. 5-6, KMnO ₄ and DI Rinses / / / / 1405 M29-3-5C Imps. 5-6 8N HCI Rinse / / / / /	2/2/01		M29-2-5C	Imps. 5-6 8N HCI Rinse	>	-	>		
1405 M29-3-2 Front Half Acetone Dry-down residue / / / / 1405 M29-3-3 0.1 N HNO ₃ Front Half rinse / / / / 1405 M29-3-4 Contents of Imps. 1-3 and 0.1 N HNO ₃ Rinse / / / / 1405 M29-3-5A Contents of Imps. 5-6, KMnO ₄ and DI Rinses / / / / 1405 M29-3-5C Imps. 5-6 8N HCI Rinse / / / /	2/2/01	1405	M29-3-1	Filter, dry	`	`	`		
1405 M29-3-3 0.1 N HNO ₃ Front Half rinse / / / / 1405 M29-3-5A Contents of Imp 4 and 0.1 N HNO ₃ Rinse / / / 1405 M29-3-5A Contents of Imps. 5-6, KMnO ₄ and DI Rinses / / / 1405 M29-3-5C Imps. 5-6 RN HCI Rinse / / / /	2/2/01		M29-3-2	Front Half Acetone Dry-down residue	>	>	>		
1405 M29-3-4 Contents of Imps. 1-3 and 0.1 N HNO ₃ Rinse / / / 1405 M29-3-5A Contents of Imps. 5-6, KMnO ₄ and DI Rinses / / / 1405 M29-3-5C Imps. 5-6 8N HCI Rinse / / /	2/2/01		M29-3-3	0.1 N HNO ₃ Front Half rinse	>	`	,		Beaker No. 3
1405 M29-3-5A Contents of Imp 4 and 0.1 N HNO ₃ Rinse / / 1405 M29-3-5B Contents of Imps. 5-6, KMnO ₄ and DI Rinses / / 1405 M29-3-5C Imps. 5-6 8N HCI Rinse / /	2/2/01		M29-3-4	Contents of Imps. 1-3 and 0.1 N HNO3 Rinse	`	5	\		
1405 M29-3-5B Contents of Imps. 5-6, KMnO, and DI Rinses / / 1405 M29-3-5C Imps. 5-6 8N HCI Rinse / / /	2/2/01		M29-3-5A	Contents of Imp 4 and 0.1 N HNO3 Rinse	>	\	\		
1405 M29-3-5C Imps. 5-6 8N HCI Rinse / /	2/2/01		M29-3-5B	Contents of Imps. 5-6, KMnO, and DI Rinses	>	\			
	2/2/01		M29-3-5C	Imps. 5-6 8N HCI Rinse	>	1	`		

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IC ENVIRONMENTAL SERVICES, INC.

Central Park W 5001 South Miami Boulevard, P.O. Box 12(Research Triangle Park, North Carolina 27709-2((919) 941-0333 FAX: (919) 941-0;

Chain of Custody Record

ENVIRONMENTAL SERVICES, INC.

			Olego To History	and record		
Project Numb		Project Name				
	F181.001		Andrews AFB Medical Waste Incinerator	Analysis requested		
Samplers					_	
	OD Holzschul	OD Holzschuh, J Falank, MD Maret				Remarks
Date	Time	Field Sample ID	Sample Description	CI.		
1/31/01	1045	1045 M26-1	Acid Impinger Contents and Rinses	`		Run 1
2/1/01	0910	0910 M26-2	Acid Impinger Contents and Rinses	`		Run 2
2/1/01	0945	0945 M26-3	Acid Impinger Contents and Rinses	`		Run 3
Refinaurand	1:) Date/Time	Received by: (Signature)	A TOWNS OF THE PARTY OF THE PAR	1 1 1 1 1 1	17 Charles 45 Charles
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Relinquished by: (Signature)	r. (Signalure)	Date/Time	Date/Time Received for lab by: (Signature) REMARKS Z/(2/n)	S		
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TO/ON/FO

First Analytical Laboratories 1126 Burning Tree Dr. Chapel Hill, NC 27514

Tel. (919) 942-8607 (919) 929-8688 FAX

ANALYSIS REPORT

Project #: 10204

Client: Pacific Environmental Services

Client Project ID: 104-01-0048

Report Date:

19-Feb-01

Date Received: 12-Feb-01

Total Micrograms in Analytical Fraction

Sample	Cd	Pb
	μg	μg
M29-1 Front	1.86	427
M29-1 Back	1.69	7.1
M29-2 Front	6.22	550
M29-2 Back	0.44	4.4
M29-3 Front	6.09	480
M29-3 Back	0.24	1.2
Blank Front	<0.02	<0.5
Blank Back	< 0.03	<0.6

QC SUMMARY

Front Spike, %Recov.	101%	100%
Back Spike, %Recov.	105%	104%



First Analytical Laboratories 1126 Burning Tree Dr. Chapel Hill, NC 27514

Tel. FAX

(919) 942-8607 (919) 929-8688

ANALYSIS REPORT

Project #: 10204

Client: Pacific Environmental Services

Client Project ID:

Report Date:

15-Feb-01

Date Received: 12-Feb-01

Total Micrograms Mercury in Analytical Fraction

Sample	Frac1	Frac2B	Frac3A	Frac3B	Frac3C	Total
Blank	<0.40	<0.95	<0.10	<0.12	<0.58	<2.15
M29-1	<0.40	58.8	1.09	3.98	9.17	73.0
M29-2	<0.40	3.85	<0.12	0.56	<1.12	4.41
M29-3	<0.40	<2.28	0.10	0.45	<1.12	0.55

QC SUMMARY

Back Spike, %Recov.

106%

Tel. (919) 942-8607 FAX (919) 929-8688

ANALYSIS REPORT

Project #: 10204

Client: Pacific Environmental Services

Client Project ID: 104-01-0048

Report Date: 19-Feb-01 Date Received: 12-Feb-01

Total Milligrams in Sample

	HCl mg
M26A-1	2.8
M26A-1 2 All	0.3
M26A-3/3 A	1.1
Blank	8.0
Spike. % Recovery	116%

CADMIUM GFAA ANALYSIS RUN SUMMARY AND CALCULATION WORKSHEET

Client: Pacific Environmental Services

Proj. #: 10204

Date: 19-Feb-01

IDL =

0.2 μg/L

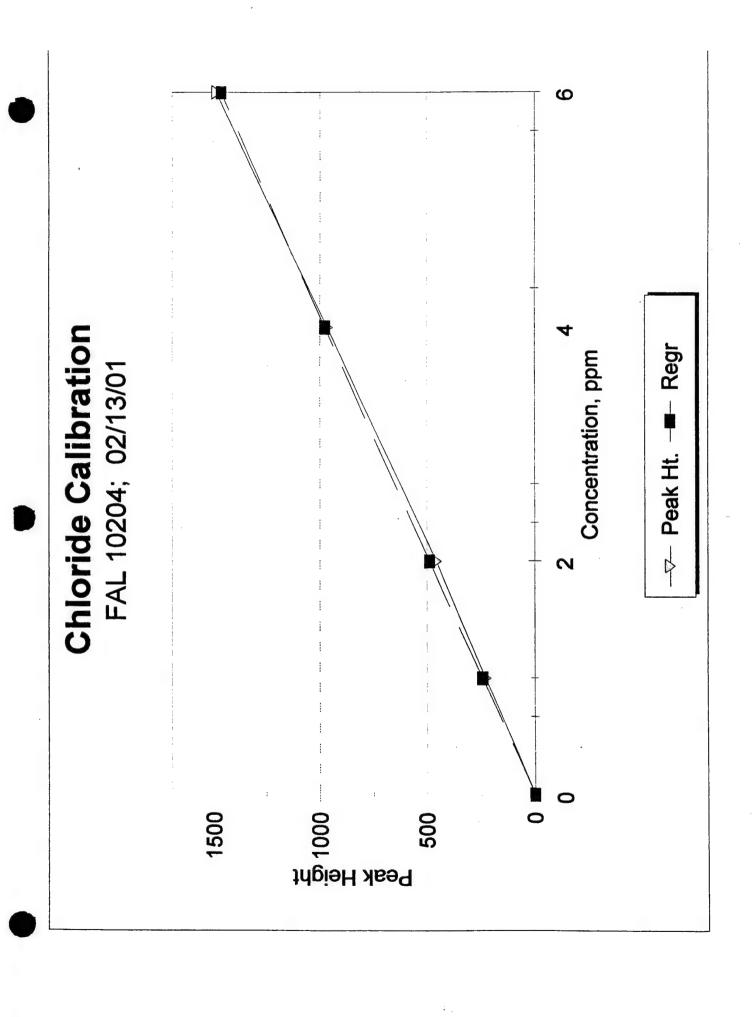
Postdig'n spike conc. =

 $5.0 \mu g/L$

Sample Client FRONT HALV	FAL	Test Sol'n μg/L	Digte Conc µg/L	FV ml	Dil'n Factor	Total Volume ml	Volume Digʻd ml		Total μg
Blank M29-1 M29-2 M29-3	10204.B-1 10204.1-1 10204.2-1 10204.3-1	0.06 3.71 6.22 6.09	0.06 18.55 62.20 60.90	100 100 100 100	1 5 10 10			<	0.02 1.86 6.22 6.09
BACK HALVE: Blank M29-1 M29-1 M29-3	\$ 10204.B-2A 10204.1-2A 10204.2-2A 10204.3-2A	0.05 2.86 3.74 1.97	0.05 14.30 3.74 1.97	100 100 100 100	1 5 1	238 641 631 570	188 541 531 470	<	0.03 1.69 0.44 0.24
FRONT SPIKE BACK SPIKE	10204.1-1S 10204.1-2AS	8.78 8.09				% REC = % REC =	101.4% 104.6%		

Calibration Data

	True conc., μg/L	Abs.	
Blank	0.0	0.000	
Standard 1	0.5	0.042	
Standard 2	2.0	0.150	
Standard 3	5.0	0.361	
Standard 4	10.0	0.644	
Calibration Verifications			
ICV = 5	5.17	CCV2 = 5	5.41
ICB = 0	0.05	CCB2 = 0	0.02
CCV1 = 5	5.35		
CCB1 = 0	0.07		



LEAD
GFAA ANALYSIS RUN SUMMARY AND CALCULATION WORKSHEET

Client: Pacific Environmental Services

Proj. #: 10204

Date: 19-Feb-01

IDL =

 $5 \mu g/L$

Postdig'n spike conc. =

100 μg/L

Sample Client FRONT HALV	FAL	Test Sol'n μg/L	Digte Conc μg/L	FV ml	Dil'n Factor	Total Volume ml	Volume Dig'd ml		Total μg
Blank M29-1 M29-2 M29-3	10204.B-1 10204.1-1 10204.2-1 10204.3-1	3.3 106.7 137.6 119.9	3.3 4268.0 5504.0 4796.0	100 100 100 100	1 40 40 40			<	0.5 426.8 550.4 479.6
BACK HALVES Blank M29-1 M29-1 M29-3	10204.B-2A 10204.1-2A 10204.2-2A 10204.3-2A	0.1 59.8 36.8 9.9	0.1 59.8 36.8 9.9	100 100 100 100	1 1 1	238 641 631 570	188 541 531 470	<	0.6 7.1 4.4 1.2
FRONT SPIKE BACK SPIKE	10204.1-1S 10204.1-2AS	206.9 164.0				% REC = % REC =	100.2% 104.2%		

Calibration Data

True conc., μg/L	Abs.	
0.0	0.000	
10	0.031	
50	0.133	
100	0.254	
200	0.449	
103.2	CCV2 = 100	106.0
1.1	CCB2 = 0	1.0
104.5		
0.7		
	10 50 100 200 103.2 1.1	0.0 0.000 10 0.031 50 0.133 100 0.254 200 0.449 103.2 CCV2 = 100 1.1 CCB2 = 0

MERCURY CVAA ANALYSIS RUN SUMMARY AND CALCULATION WORKSHEET

Client: Pacific Environmental Services

 $IDL = 0.2 \mu g/L$

Proj. #: 10204

Postdig'n spike conc. =

5.0 μg/L

Date: 14-Feb-01

Sample ID		Test	Dig'te		Dil'n		Digsťd		
Client	FAL	Sol'n	Conc	FV	Factor	Volume	Vol.		Total
		μg/L	μg/L	ml		ml	ml		μg
FRONT HALVI	ES								
Blank	10204.B-1	-0.13	-0.13	100	1	100	5	<	0.40
M29-1	10204.1-1	-0.10	-0.10	100	1	100	5	<	0.40
M29-2	10204.2-1	-0.02	-0.02	100	1	100	5	<	0.40
M29-3	10204.3-1	0.16	0.16	100	1	100	5	<	0.40
FRACTIONS 2	В								•
Blank	10204.B-2B	-0.13	-0.13	100	1	238	5	<	0.95
M29-1	10204.1-2B	2.75	2.75	100	1	641	3		58.76
M29-2	10204.2-2B	0.31	0.31	100	1	631	5		3.85
M29-3	10204.3-2B	0.18	0.18	100	1	570	5	<	2.28
BACK SPK	10204.1-2BS	8.05				%REC =	106.0%		
•									
FRACTIONS 3	A								
Blank	10204.B-3A	0.11	0.11	100	1	50	10	<	0.10
M29-1	10204.1-3A	1.88	1.88	100	1	58	10		1.09
M29-2	10204.2-3A	0.15	0.15	100	1	59	10	<	0.12
M29-3	10204.3-3A	0.27	0.27	100	1	39	10		0.10
FRACTIONS 3	8								
Blank	10204.B-3B	0.07	0.07	100	1	118	20	<	0.12
M29-1	10204.1-3B	1.89	1.89	100	1	421	20		3.98
M29-2	10204.2-3B	0.25	0.25	100	1	446	20		0.56
M29-3	10204.3-3B	0.21	0.21	100	1	432	20		0.45
FRACTIONS 3	C								
Blank	10204.B-3C	0.13	0.13	100	1	. 144	5	<	0.58
M29-1	10204.1-3C	1.62	1.62	100	1	284	5		9.17
M29-2	10204.2-3C	0.17	0.17	100	1	281	5	<	1.12
M29-3	10204.3-3C	0.11	0.11	100	1	279	5	<	1.12

MERCURY CVAA ANALYSIS RUN SUMMARY AND CALCULATION WORKSHEET

Client: Pacific Environmental Services

Proj. #: 10204 Date: 14-Feb-01

Calibration Data			Run1		
		Abs.	True conc., µg/L		
	Blank	0.000	0.00		
·	Standard 1	0.007	0.50		
	Standard 2	0.018	1.00		
	Standard 3	0.044	2.00		
	Standard 4	0.107	5.00		
	Standard 5	0.208	10.00		
Calibration Verif	ications				
	ICV = 5	5.30		CCV2 = 5	5.13
	ICB = 0	-0.15		CCB2 = 0	-0.04
	CCV1 = 5	5.40		CCV3 = 5	5.15
	CCB1 = 0	-0.21		CCB3 = 0	0.13

Element File: CD.GEL Element: Cd Wavelength: 228.8 Time: 08:24 Slit: 0.70 L Date: 02/09/81 Data File: 10204CD.DAT ID/Wt File: 10204.IDW Lamp Current: 5 Energy: 42 Calib. Type: Nonlinear Technique: HGA Seq. No.: 00001 A/S Pos.: 0 Date: 02/09/8 Cd ID: BLANK Time: 08:24 Replicate 1 Peak Height (A): 0.019 Peak Area (A-s): -0.001 Background Pk Area (A-s): 0.007 Background Pk Height (A): 0.014 Blank Corrected Pk Area (A-s): -0.001 Time: 08:28 Replicate 2 Peak Height (A): 0.017 Peak Area (A-s): -0.005 Background Pk Height (A): 0.031 Background Pk Area (A-s): 0.056 Blank Corrected Pk Area (A-s): -0.005 RSD(%): 83.54 Mean Pk Area (A-s): -0.003 ' SD: 0.0028 Auto-zero performed. Seq. No.: 00002 A/S Pos.: 1 Date: 02/09/8 Cd ID: 0.5 PPB CD Time: 08:31 Replicate 1 Peak Height (A): 0.083 Peak Area (A-s): 0.038 Background Pk Height (A): 0.040 Background Pk Area (A-s): 0.081 Blank Corrected Pk Area (A-s): 0.041 Time: 08:34 Replicate 2 Peak Area (A-s): 0.039 Peak Height (A): 0.087 Background Pk Height (A): 0.043 Background Pk Area (A-s): 0.086 Blank Corrected Pk Area (A-s): 0.043 SD: 0.0011 RSD(%): 2.74 Mean Pk Area (A-5): 0.042 Standard number 1 applied. [0.50] Slope: 0.0839 Correlation coefficient: 1.00000 Seq. No.: 00003 A/S Pos.: 2 Date: 02/09/4 Cd ID: 2 PPB CD Time: 08:37 Replicate 1 Peak Height (A): 0.280 Peak Area (A-5): 0.146 Background Pk Area (A-s): 0.110 Background Pk Height (A): 0.053 Blank Corrected Pk Area (A-s): 0.150 Concentration (ug/L): 1.78

Replicate 2

Peak Area (A-s): 0.147

Background Pk Area (A-s): 0.111

Blank Corrected Pk Area (A-s): 0.150

Concentration (ug/L): 1.79

Mean Conc (ug/L): 1.79

SD: 0.005

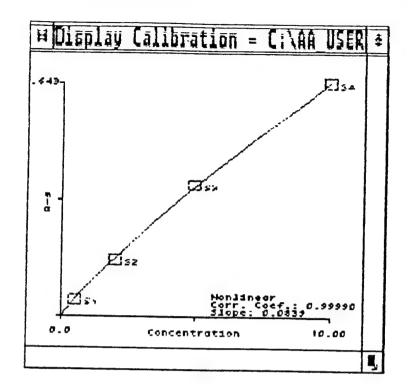
Time: 08:40

Peak Height (A): 0.297

Background Pk Height (A): 0.045

RSD(%): 0.30

Standard number 2 applied. [2.00]



OK ID: ICV Sea. No.: 00006 A/S Pos.: 5 Date: 02/09/ Replicate 1 Time: 08:58 Concentration (ug/L): 5.22 Replicate 2 Time: 09:01 Concentration (ug/L): 5.11 Mean Conc (ug/L): 5.17 SD: 0.084 RSD(%): 1.62 QC sample is within range Cd ID: ICB Seq. No.: 00007 A/S Pos.: 0 Date: 02/05 Replicate 1 Time: 09:04 Concentration (ug/L): 0.06 Replicate 2 Time: 09:08 Concentration (ug/L): 0.03 Mean Conc (ug/L): 0.05 SD: 0.020 RSD(%): 44.02 QC sample is within range Cd ID: 10204.B-1 Seq. No.: 00008 A/S Pos.: 6 Date: 02/05 Replicate 1 Time: 09:11 Concentration (ug/L): 0.04

Time: 09:14

Replicate 2

Concentration (ug/L): 0.08 Mean Conc (ug/L): 0.06 SD: 0.029 RSD(%): 45.11 Cd ID: 10204.1-1 X20 Seq. No.: 00009 A/S Pos.: 7 Date: 02/09/ Time: 09:17 Replicate 1 Concentration (ug/L): 0.97 Corrected Conc (ug/L): 19.4 Cd ID: 10204.1-1 X5 Seq. No.: 00010 A/S Pos.: 7 Date: 02/09/ Time: 09:25 Replicate 1 Concentration (ug/L): 3.64 Corrected Conc (ug/L): 18.2 Replicate 2 Time: 09:28 Concentration (ug/L): 3.78 Corrected Conc (ug/L): 18.88 3.71 SD: 0.098 RSD(%): 2.65 Mean Conc (uo/L): Corrected Conc (ug/L): 18.5

Cd ID: 10204.1-1 X5 Seq. No.: 00011 A/S Pos.: 7 Date: 02/09/

Replicate 1 Time: 09:32 Concentration (ug/L): 8.73 Corrected Conc (ug/L): 43.7

Replicate 2 Time: 09:35
Concentration (ug/L): 8.82 Corrected Conc (ug/L): 44.1

Mean Conc (ug/L): 8.78 SD: 0.062 RSD(%): 0.71 Corrected Conc (ug/L): 43.9

Recovery is 101.4%

Sample abs. is greater than that of the largest standard.

Replicate 1 Time: 09:38

Concentration (ug/L): 12.08 Corrected Conc (ug/L): 60.4

Cd ID: 10204.2-1 X10 Seq. No.: 00014 A/S Pos.: 8 Date: 02/09/

Replicate 1 Time: 09:45

Replicate 2 Time: 09:49

Concentration (ug/L): 6.06 Corrected Conc (ug/L): 60.6

Mean Conc (ug/L): 6.22 SD: 0.223 RSD(%): 3.59

Corrected Conc (ug/L): 62.2

Cd ID: 10204.3-1 X10 Seq. No.: 00015 A/S Pos.: 9 Date: 02/09/

```
Time: 09:52
Concentration (ug/L ): 6.14
                            Corrected Conc (ug/L ): 61.4
Replicate 2
                            Time: 09:55
Concentration (ug/L ): 6.05
                            Corrected Conc (ug/L ): 60.5
Mean Conc (ug/L ):
                   6.09
                            SD: 0.061
                                              RSD(%): 1.01_
Corrected Conc (ug/L ): 60.9
Cd ID: CCV
                    Seq. No.: 00016 A/S Pos.: 3
                                             Date: 02/09 (
Replicate 1
                            Time: 09:59
Concentration (ug/L ): 5.30
Replicate 2
                            Time: 10:02
Concentration (ug/L ): 5.39
Mean Conc (ug/L ): 5.35 SD: 0.066
                                              RSD(%): 1.23
QC sample is within range
<u></u>
Cd ID: CCB
                     Seq. No.: 00017 A/S Pos.: 0
                                             Date: 02/094
Replicate 1
                            Time: 10:05
Concentration (uq/L ): 0.04
Replicate 2
                            Time: 10:08
Concentration (ug/L ): 0.09
Mean Conc (ug/L ): 0.07
                       SD: 0.033
                                             RSD(%): 50.2
QC sample is within range
ID: 10204.B-2A
                    Seq. No.: 0001B A/S Pos.: 10 Date: 02/09/
Replicate 1
                            Time: 10:11
Concentration (up/L ): -0.07
Replicate 2
                            Time: 10:15
Concentration (ug/L ): 0.16
Mean Conc (ug/L ): 0.05
                            SD: 0.162
                                             RSD(%): 342.5
ID: 10204.1-2A
                    Seq. No.: 00019 A/S Pos.: 11
                                              Date: 02/09 *
Sample abs. is greater than that of the largest standard.
Replicate 1
                           Time: 10:18
Concentration (ug/L ): 13.89
Cd ID: 10204.1-2A X5 Seq. No.: 00020 A/S Pos.: 11
                                              Date: 02/0° '
Replicate 1
                            Time: 10:24
Concentration (ug/L ): 2.94
                            Corrected Conc (ug/L ): 14.7
```

Replicate

Replicate 2
Concentration (ug/L): 2.79

Mean Conc (ug/L): 2.86

Time: 10:28
Corrected Conc (ug/L): 13.9

RSD(%): 3.81

Corrected Conc (ug/L): 14.3

Cd ID: 10204.1-2A X5 Seq. No.: 00021 A/S Pos.: 11 Date: 02/09/8

Replicate 1 Time: 10:31

Concentration (ug/L): 8.14 Corrected Conc (ug/L): 40.7

Replicate 2 Time: 10:34

Concentration (ug/L): 8.04 Corrected Conc (ug/L): 40.2

Mean Conc (ug/L): B.09 SD: 0.067 RSD(%): 0.83

Corrected Conc (ug/L): 40.5

Recovery is 104.5%

Cd ID: 10204.2-2A X5 Seq. No.: 00022 A/S Pos.: 12 Date: 02/09/8

Replicate 1 Time: 10:37

Cd ID: 10204.2-2A Seg. No.: 00023 A/S Pos.: 12 Date: 02/09/

Replicate 1 Time: 10:41

Concentration (ug/L): 3.62

Replicate 2 Time: 10:45

Concentration (ug/L): 3.86

Mean Conc (ug/L): 3.74 SD: 0.170 RSD(%): 4.54

Cd ID: 10204.3-2A Seq. No.: 00024 A/S Pos.: 13 Date: 02/09/

Replicate 1 Time: 10:48

Concentration (ug/L): 2.05

Replicate 2 Time: 10:51

Concentration (ug/L): 1.90

Mean Conc (ug/L): 1.97 SD: 0.106 RSD(%): 5.39

Cd ID: CCV Seq. No.: 00025 A/S Pos.: 3 Date: 02/09/

Replicate 1 Time: 10:54

Concentration (ug/L): 5.43

Replicate 2 Time: 10:57

Concentration (ug/L): 5.39

Mean Conc (ug/L): 5.41 SD: 0.031 RSD(%): 0.57

QC sample is within range

Cd ID: CCB Seo. No.: 00026 A/S Pos.: 0 Date: 02/09

Replicate 1 Time: 11:01

Concentration (ug/L): 0.06

Replicate 2 Time: 11:04

Concentration (ug/L): -0.03

Mean Conc (ug/L): 0.02 SD: 0.062 RSD(%): 408.

QC sample is within range

Wavelenoth: 283.3 Element: Pb Flement File: PB.GEL Slit: 0.70 L Time: 07:59 Date: 02/08/81 ID/Wt File: 20203.IDW Lamp Current: 10 Data File: Calib. Type: Nonlinear Energy: 47 Technique: HGA A/S Pos.: 0 Date: 02/08/8 Seq. No.: 00001 ID: BLANK Pb Time: 07:59 Replicate 1 Peak Height (A): 0.014 Peak Area (A-s): 0.002 Background Pk Height (A): 0.044 Background Pk Area (A-s): 0.039 Blank Corrected Pk Area (A-s): 0.002 Time: 08:02 Replicate 2 Peak Height (A): 0.016 Peak Area (A-s): 0.000 Background Pk Height (A): 0.032 Background Pk Area (A-s): 0.025 Blank Corrected Pk Area (A-s): 0.000 RSD(%): 88.39 SD: 0.0010 Mean Pk Area (A-s): 0.001 Auto-zero performed. Seg. No.: 00002 A/S Pos.: 1 Date: 02/08/8 Ph ID: 10 PPB PB Time: 08:06 Replicate 1 Peak Height (A): 0.064 Peak Area (A-s): 0.033 Background Pk Height (A): 0.122 Background Pk Area (A-s): 0.058 Blank Corrected Pk Area (A-s): 0.031 Time: 08:09 Replicate 2 Peak Height (A): 0.083 Peak Area (A-s): 0.032 Background Pk Height (A): 0.039 Background Pk Area (A-s): 0.027 Blank Corrected Pk Area (A-s): 0.031 RSD(%): 0.52 Mean Pk Area (A-s): 0.031 SD: 0.0002 Standard number 1 applied. [10.0] Slope: 0.0031 Correlation coefficient: 1.00000 Seq. No.: 00003 A/S Pos.: 2 Date: 02/08/ Pb ID: 50 PPB PB Time: 08:12

Replicate 1
Peak Area (A-s): 0.134
Background Pk Area (A-s): 0.050
Blank Corrected Pk Area (A-s): 0.133
Concentration (ug/L): 42.4

Peak Height (A): 0.333
Background Pk Height (A): 0.071

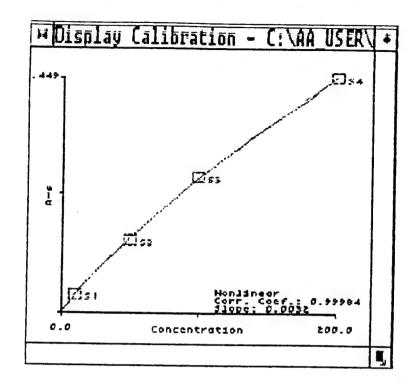
Replicate 2
Peak Area (A-s): 0.133
Background Pk Area (A-s): 0.050
Blank Corrected Pk Area (A-s): 0.132
Concentration (ug/L): 42.3

Peak Height (A): 0.329
Background Pk Height (A): 0.072

Mean Conc (ug/L): 42.3 SD: 0.03 RSD(%): 0.08

Time: 08:16

Standard number 2 applied. [50.0]



```
OK
                        Sea. No.: 0000B
                                       A/S Pos.: 5
                                                     Date: 02/08/8
Replicate 1
                                Time: 08:45
Concentration (ug/L ): 99.7
Replicate 2
                                Time: 08:48
Concentration (ug/L ): 106.7
Mean Conc (ug/L ): 103.2 SD: 4.93
                                                    RSD(%): 4.77
QC sample is within range 79.5 - 120.49
    ID: ICB
                        Seq. No.: 00009 A/S Pos.: 0
                                                     Date: 02/08 (
Replicate 1
                                Time: 08:52
Concentration (ug/L ): 1.7
Replicate 2
                                Time: 08:55
Concentration (ug/L ): 0.5
Mean Conc (ug/L ):
                  1.1
                               SD: 0.83
                                                    RSD(%): 74.89
QC sample is within range -5.49 - 5.49
 ID: 20203.LB1
                       Seq. No.: 00010
                                       A/S Pos.: 6
                                                     Date: 02/0E (
```

Time: 08:58

Time: 09:02

. 4

Replicate

Replicate 2

Concentration (ug/L): 1.1

Concentration (ug/L): 1.1

Concentration (ug/L): 144.8 Time: 14:57 Replicate 2 Concentration (ug/L): 144.1 RSD(%): 0.33 Mean Conc (ug/L): 144.5 SD: 0.48 Seg. No.: 00064 A/S Pos.: 26 Date: 02/08/8 ID: 20203.30-3 Replicate 1 Time: 15:01 Concentration (ug/L): 142.4 Time: 15:04 Replicate 2 Concentration (ug/L): 143.5 RSD(%): 0.54 Mean Conc (ug/L): 143.0 SD: 0.77 Pb ID: 20203.30-4 Seq. No.: 00065 A/S Pos.: 27 Date: 02/08/8 Replicate 1 Time: 15:07 Concentration (ug/L): 153.3 Replicate 2 Time: 15:11 Concentration (ug/L): 152.1 Mean Conc (ug/L): 152.7 SD: 0.84 RSD(%): 0.55 ID: 20203.30-6 Seg. No.: 00066 A/S Pos.: 28 Date: 02/08/8 Time: 15:14 Replicate 1 Concentration (ug/L): 137.5 Replicate 2 Time: 15:17 Concentration (ug/L): 136.8 Mean Conc (ug/L): 137.2 SD: 0.50 RSD(%): 0.37Pb ID: 20203.30-7 Seg. No.: 00067 A/S Pos.: 29 Date: 02/08/E Replicate 1 Time: 15:21 Concentration (ug/L): 3.0 Replicate 2 Time: 15:24 Concentration (ug/L): 1.3 Mean Conc (ug/L): 2.1 SD: 1.19 RSD(%): 56.46 Pb ID: CCV Seq. No.: 0006B A/S Pos.: 3 Date: 02/08/E Replicate Time: 15:27 Concentration (ug/L): 104.3 Replicate 2 Time: 15:31

Concentration (ug/L): 104.8

Mean Conc (ug/L): 104.5 SD: 0.34 RSD(%): 0.33

QC sample is within range 79.5 - 120.49

---^^^^^^^^^^^

Pb ID: CCB Seq. No.: 00069 A/S Pos.: 0 Date: 02/08/6

Replicate 1 Time: 15:34

Concentration (ug/L): 1.2

Replicate 2 Time: 15:38

Concentration (ug/L): 0.3

Mean Conc (ug/L): 0.7 SD: 0.65 RSD(%): 90.3~

QC sample is within range -5.49 - 5.49

Replicate 1 Time: 15:44

Concentration (ug/L): 3.1

Replicate 2 Time: 15:48

Concentration (ug/L): 3.4

Mean Conc (ug/L): 3.3 SD: 0.22 RSD(%): 6.64

Pb ID: 10204.1-1 X20 Seq. No.: 00071 A/S Pos.: 7 Date: 02/0B/{

Replicate 1 Time: 15:51

Concentration (ug/L): 204.6 Corrected Conc (ug/L): 4092.

Pb ID: 10204.1-1 X40 Seq. No.: 00072 A/S Pos.: 7 Date: 02/08/8

Replicate 1 Time: 15:57

Concentration (ug/L): 108.1 Corrected Conc (ug/L): 4322.

Replicate 2 Time: 16:00

Concentration (ug/L): 105.4 Corrected Conc (ug/L): 4216.

Mean Conc (ug/L): 106.7 SD: 1.88 RSD(%): 1.76

Corrected Conc (ug/L): 4269.

Pb ID: 10204.1-1 X40 Seq. No.: 00073 A/S Pos.: 7 Date: 02/08

Replicate 1 Time: 16:04

Concentration (ug/L): 209.8 Corrected Conc (ug/L): 8390.

Replicate 2 Time: 16:07

Concentration (ug/L): 204.1 Corrected Conc (ug/L): 8164.

Mean Conc (ug/L): 206.9 SD: 3.99 RSD(%): 1.93_

Corrected Conc (ug/L): 8277.

Recovery is 100.2%

A/S Pos.: B Sea. No.: 00074 Date: 02/08/8 ID: 10204.2-1 X40 РЬ Time: 16:11 Replicate 1 Corrected Conc (ug/L): 5529. Concentration (ug/L): 138.2 Time: 16:14 Replicate 2 Corrected Conc (ug/L): 5480. Concentration (ug/L): 137.0 RSD(%): 0.63 Mean Conc (ug/L): 137.6 SD: 0.86 Corrected Conc (ug/L): 5505. ID: 10204.3-1 X40 Seq. No.: 00075 A/S Pos.: 9 Date: 02/08/8 Time: 16:17 Replicate 1 Corrected Conc (ug/L): 4863. Concentration (ug/L): 121.6 Time: 16:21 Replicate 2 Corrected Conc (ug/L): 4731. Concentration (ug/L): 118.3 RSD(%): 1.95 SD: 2.34 Mean Conc (ug/L): 119.9 Corrected Conc (ug/L): 4797. Seo. No.: 00076 A/S Pos.: 10 Date: 02/08/8 Pb ID: 10204.B-2A Time: 16:24 Replicate 1 Concentration (ug/L): 0.7 Time: 16:27 Replicate 2 Concentration (ug/L): -0.4 SD: 0.77 RSD(%): 595.48 Mean Conc (ug/L): 0.1 Sec. No.: 00077 A/S Pos.: 11 Date: 02/08/6 Pb ID: 10204.1-2A Time: 16:31 Replicate 1 Concentration (ug/L): 59.2 Time: 16:34 Replicate 2 Concentration (ug/L): 60.3 RSD(%): 1.38 SD: 0.82 Mean Conc (ug/L): 59.8 Seq. No.: 00078 A/S Pos.: 11 Pb ID: 10204.1-2A Date: 02/08/ Time: 16:38 Replicate 1 Concentration (ug/L): 165.0 Time: 16:41 Replicate 2

Mean Conc (ug/L): 164.0 SD: 1.45 RSD(%): 0.88

Recovery is 104.3%

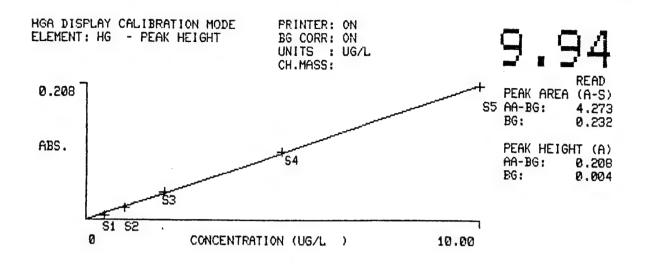
Concentration (ug/L): 163.0

Pb ID: 10204.2-2A Seo. No.: 00079 A/S Pos.: 12 Date: 02/08.3 Replicate 1 Time: 16:44 Concentration (ug/L): 37.5 Replicate 2 Time: 16:48 Concentration (ug/L): 36.0 Mean Conc (ug/L): 36.8 SD: 1.08 RSD(%): 2.94 Seq. No.: 00080 A/S Pos.: 13 Date: 02/08/E ID: 10204.3-2A Replicate 1 Time: 16:51 Concentration (ug/L): 10.4 Replicate 2 Time: 16:54 Concentration (ug/L): 9.4 Mean Conc (ug/L): 9.9 SD: 0.69 RSD(%): 6.99 Pb ID: CCV Seq. No.: 00081 A/S Pos.: 3 Date: 02/08/5 Replicate 1 Time: 16:58 Concentration (ug/L): 105.2 Replicate 2 Time: 17:01 Concentration (ug/L): 106.7 Mean Conc (ug/L): 106.0 SD: 1.05 RSD(%): 0.99 QC sample is within range 79.5 - 120.49 Pb ID: CCB Seo. No.: 00082 A/S Pos.: 0 Date: 02/08/8 Replicate 1 ' Time: 17:04 Concentration (ug/L): 1.9 Replicate 2 Time: 17:08 Concentration (ug/L): 0.2 Mean Conc (ug/L): 1.0 SD: 1.24

QC sample is within range -5.49 - 5.49

RSD(%): 119. (

9.94 5.STANDARD



								. — — — — —
HG MAIN:	IcV 5.30	UG/L	AA-BG PA 2.157 PH 0.111	0.244	HG MAIN:	ICB -0.15 UG/L	AA-BG PA-0.021 PH-0.003	0.208
HG MAIN:	B-2B -0.13	UG/L	AA-BG PA-0.015 PH-0.003	0.183	HG MAIN:	-0.13 UG/L	AA-BG PA 0.003 PH-0.003	0.217
HG MAIN:	1-2B 2.73	UG/L	AA-BG PA 1.150 PH 0.057	0.241	HG MAIN:	2.77 UG/L	AA-BG PA 1.217 PH 0.058	0.235
HG MAIN:	1-285 B. 01	UG/L	AA-BG PA 3.245 PH 0.168	0.243	HG MAIN:	8.09 UG/L	AA-BG PA 3.301 PH 0.170	0.223
HG MAIN:	2-28 0.38	UG/L	AA-BG PA 0.165 PH 0.008	0.152		0.23 UG/L	AA-BG FA 0.161 PH 0.005	0.226
HG MAIN:	3-2B 0.21	UG/L	AA-BG PA 0.143 PH 0.004	0.238	HG MAIN:	0.15 UG/L	AA-BG PA 0.141 PH 0.003	BG 0.176 0.001
HG MAIN:	B-1 -0.13	UG/L	AA-BG PA-0.026 PH-0.003	0.244	HG MAIN:	-0.13 UG/L	AA-BG PA 0.010 PH-0.003	0.215
	/-/ -0.10	UG/L	AA-BG PA 0.022 PH-0.002	0.239		-0.10 UG/L	AA-BG PA 0.020 PH-0.002	
HG MAIN:	2-1	UG/L	AA-BG PA-0.009 PH-0.002	0.260	HG MAIN:	<i>CCV</i> 5.40 UG/L	AA-BG PA 2.297 PH 0.113	BG ** 0.222 0.002
HG MAIN:	CCB -0.21		AA-BG PA-0.035 PH-0.004	0.148				AND STATE STATE STATE AND ALLEY .

A	1100	91/02/14	PAGE	π,
7	1100	G1/02/14	FAGE	0

AUTOZERO BG HG 3-1 boul AA-BG BG 2-/ AA-BG HG 0.101 MAIN: 0.21 UG/L PA 0.114 0.058 0.06 UG/L MAIN: PA 0.042 PH 0.004 -0.000 PH 0.001 0.002 3-1 HG AA-BG 0.11 UG/L PA 0.080 0.070 MAIN: 0.001 PH 0.002 AA-BG HG BG AA-BG HG MAIN: 0.10 UG/L PA 0.029 -0.038 0.11 UG/L PA 0.042 0.083 MAIN: PH 0.002 -0.002 PH 0.002 0.003 1-3A BG HG AA--BG HG AA-RG BG 0.114 MAIN: 1.91 UG/L PA 0.802 1.85 UG/L PA 0.746 0.107 PH 0.040 0.000 PH 0.039 0.002 2-3A AA-BG BG BG AA-BG HG HG 0.101 MAIN: 0.15 UG/L PA 0.076 0.15 UG/L PA 0.052 0.102 PH 0.003 PH 0.003 0.000 0.000 3-3A AA-BG BG AA-BG BG PA 0.114 MAIN: 0.34 UG/L 0.090 0.014 0.19 UG/L PA 0.094 PH 0.007 PH 0.004 -0.000 . AA-BG BG BG HG HG AA-BG MAIN: 0.02 UG/L PA 0.034 0.088 MAIN: 0.11 UG/L PA 0.036 0.089 PH 0.002 0.000 PH 0.000 -0.000 HG 1-38 BG AA-BG HG AA-BG BG MAIN: 1.95 UG/L PA 0.773 0.073 MAIN: 1.83 UG/L PA 0.742 0.136 PH 0.038 PH 0.041 0.002 AA-BG BG HG CCB CCV AA-BG BG HG 5.13 UG/L PA 2.166 -0.056 MAIN: -0.04 UG/L PA-0.004 0.016 MAIN: PH-0.001 0.004 PH 0.108 0.006 2-38 BG AA-BG HG AA-BG 0.29 UG/L MAIN: 0.21 UG/L PA 0.115 -0.092 PA 0.122 -0.208 PH 0.006 -0.000 PH 0.004 0.003 BG AA-BG HG AA-BG MAIN: 0.23 UG/L PA 0.106 -0.254 MAIN: 0.19 UG/L PA 0.077 -0.220 PH 0.005 0.003 PH 0.004 -0.000 B-3c AA-BG BG HG HG AA-BG 5 ml MAIN: 0.19 UG/L PA 0.058 -0.106 MAIN: 0.06 UG/L PA 0.022 -0.648 PH 0.004 PH 0.001 -0.001 HG 1-3C BG AA-BG HG AA-BG PA 0.682 -0.195 MAIN: 1.68 UG/L PA 0.687 -0.359 MAIN: 1.55 UG/L PH 0.035 0.016 PH 0.032 -0.001 2-30 AA-BG BG HG AA-BG MAIN: 0.17 UG/L PA 0.084 -0.488 MAIN: 0.17 UG/L PA 0.074 0.011 PH 0.004 0.003 PH 0.004 0.012 3-3C BG BG AA-BG HG AA-BG MAIN: 0.08 UG/L MAIN: 0.13 UG/L PA 0.041 -0.265 PA 0.019 0.004 PH 0.003 0.013 PH 0.002 0.000

PERKIN-ELMER

PERKIN-ELMER M 1100 **0**1/02/14 PAGE 4 CCB CCV HG BGAA-BG HG AA-BG BG 5.15 UG/L MAIN: PA 2.200 MAIN: 0.13 UG/L 0.026 PA 0.054 0.056 -PH 0.108 0.003 PH 0.003 0.000

Appendix C.2
Analytical Data
Dioxins/Furans (M23)

25 FEB 2001

Michael Maret PES 5001 South Miami Blvd Research Triangle Park, NC 27703

Ph.: 919-941-0333 Fax: 919-941-0234

Dear Mike:

Attached to this narrative are the analytical results you requested on samples submitted for the determination of polychlorinated dibenzo-p-dioxins and dibenzofurans. The insert below summarizes the relevant information pertaining to your project. In particular, the QC annotations bring to your attention specific analytical observations and assessments made during the sample handling and data interpretation phases. A brief description of the report's components is provided on the next page.

Your Project No.:

AAP Project No.:

Analytical Protocol:

No. of Samples Submitted:

No. of Samples Analyzed:

No. of Lab Method Blanks (MB):

No. of OPRs:

F181.001

P1388

Method 23

4 (RB on hold)

3

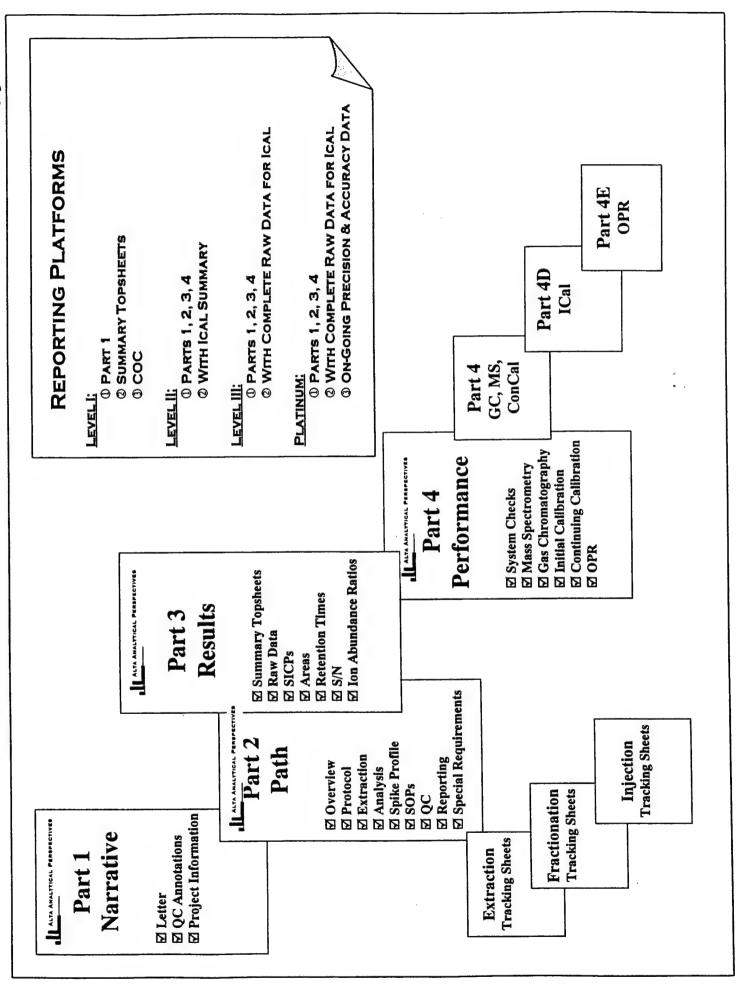
QC Annotations:

- The data meet QA/QC requirements.
- An "A" data qualifier is used for analytes with a concentration falling below the calibration curve.
- 3. Sample "M23-1" required additional cleanup to produce data of acceptable quality.

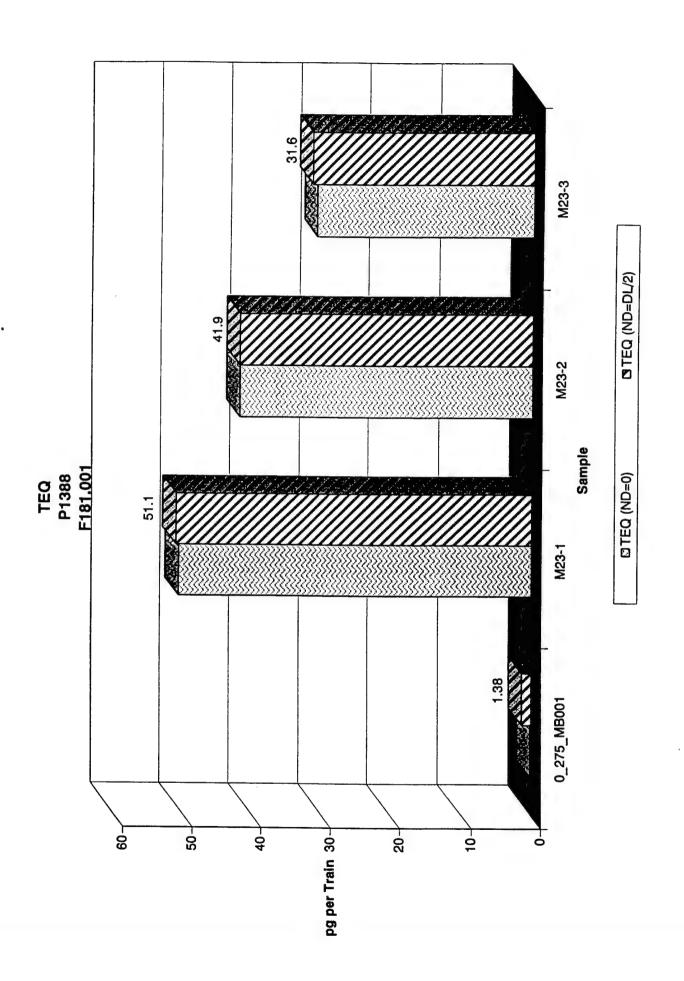
Alta Analytical Perspectives remains committed to serving you in the most effective manner. Should you have any questions or need additional information and technical support, please, do not hesitate to contact us at the telephone numbers shown below. We wanted to thank you for choosing Alta Analytical Perspectives as part of your analytical support team.

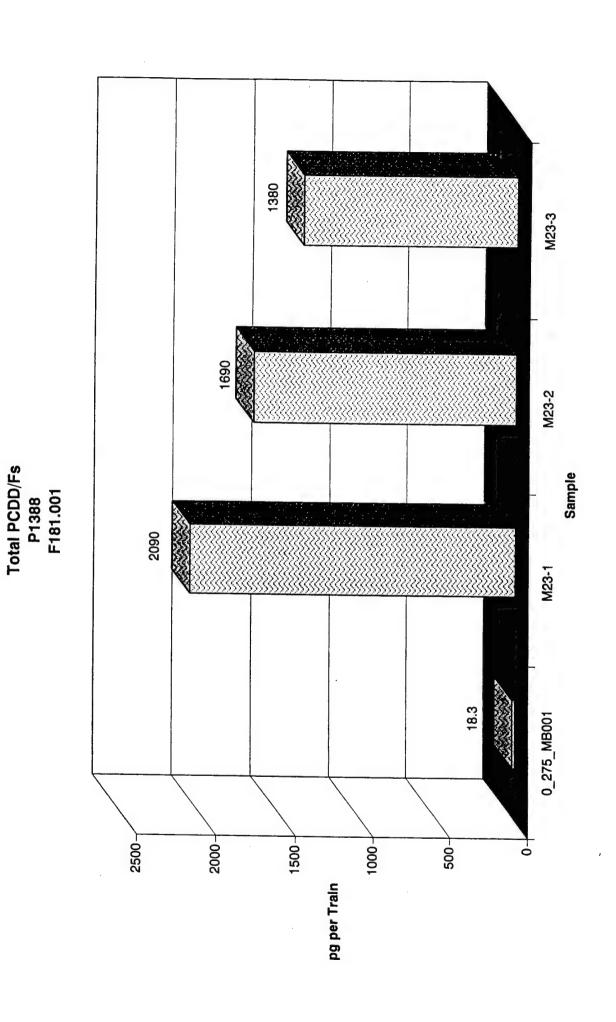
Sincerely,

Yves Tondeur, Ph.D.



Sample Summary	=	ALTA ANALYTICAL PERBFECTIVES		Method M23
Analyte	0_275_MB001	M23-1	M23-2	M23-3
	bd	bd	bd	Вd
2,3,7,8-TCDD	[1.29]	(0.792)	0.945	(0.58)
1,2,3,7,8-PeCDD	(0.997)	[1.74]	2.44	(1.63)
1,2,3,4,7,8-HxCDD	(1.68)	4.56	[1.96]	2.54
1,2,3,6,7,8-HxCDD	(1.87)	7.58	[5.04]	4.63
1,2,3,7,8,9-HxCDD	(1.68)	4.64	2.76	[2.25]
1,2,3,4,6,7,8-HpCDD	[4.9]	27.3	21.5	20.5
OCDD	12.9	74.4	57.1	63.3
2,3,7,8-TCDF	(1.27)	11,3	8.77	7.39
1,2,3,7,8-PeCDF	(1.84)	20.9	15.2	11.6
2,3,4,7,8-PeCDF	(1.81)	46.6	36.1	26.5
1,2,3,4,7,8-HxCDF	1.69	48.9	40	28.9
1,2,3,6,7,8-HxCDF	(0.552)	54.6	45.7	35.5
2,3,4,6,7,8-HxCDF	(0.586)	87.3	73.7	60.2
1,2,3,7,8,9-HxCDF	(0.67)	13.7	11.1	8.99
1,2,3,4,6,7,8-HpCDF	1.86	234	208	172
1,2,3,4,7,8,9-HpCDF	(2.03)	26.5	22.2	18.8
OCDF	(2.83)	145	118	113
Totals & TEQs				
TCDDs	Q.	17.3	13	3.93
Pecdos	Q	41.3	31.3	18.8
HXCDDs	2	68.2	42.9	38.9
HpCDDs	1.83	55.6	44.4	41.5
TCDFs	Q	345	265	205
PecDFs	2	451	354	277
HxCDFs	1.69	517	441	345
HpCDFs	1.86	370	328	274
Total PCDD/Fs	18.3	2090	1690	1380
TEQ (ND=0)	0.200	20.7	41.9	30.9
TEQ (ND=DL/2)	1.38	51.1	41.9	31.6





Sample ID:	0_275_MB001	101				Me	Method M23
Cllent Data Name: Project ID: Date Collected:	PES F181.001 n/a	Sample Data Matrix: Weight/Volume:	Air 1	Laboratory Data Project No.: Sample ID: QC Batch No.:	P1388 0_275_MB001 275	Date Received: Date Extracted: Date Analyzed:	n/a 8-Feb-01 14-FEB-01
Analyte	Conc.	DL	EMPC	Qualifier		Recoveries	
	bd	pg	bd		SI	SS	AS
2,3,7,8-TCDD	EMPC		1.29	¥	9'66	98.2	85.4
1,2,3,7,8-PeCDD	2	0.997			100	96.4	85.4
1,2,3,4,7,8-HxCDD	2 :	1.68 1.68			100	97.1	85.4
1,2,3,6,7,8-HxCDD	2 2	1.87		77-	000	97.1	85.4
1,2,3,4,6,7,8-HpCDD	EMPC		6.1		8 6	99.1	85.4
осор	12.9			∀	95.7	99.1	85.4
2,3,7,8-TCDF	Q	1.27		2.22	100	98.2	85.4
1,2,3,7,8-PeCDF	Q	1.84			93.6	96.4	85.4
2,3,4,7,8-PeCDF	2	2 .		· .	93.6	96.4	85.4
1,2,3,4,7,8-HxCDF	1.69			∢	86.5	97.3	85.4
1,2,3,6,7,8-HxCDF	2	0.552		-:	86.5	97.3	85.4
2,3,4,6,7,8-HxCDF	2 !	0.586			86.5	97.3	85.4
1,2,3,7,8,9-HxCDF	2	0.67		•	86.5	97.3	85.4
1,2,3,4,6,7,8-HpCDF	1.86		5	∢ .	88	99.1	85.4
1,2,3,4,7,8,9-HpCDF	2 :	2.03			88	99.1	85.4
OCDF	QN	2.83			91	99.1	85.4
Totals & TEQs					•		
TCDDs	Q		1.29		ALTA /	ALTA ANALYTICAL PERSPECTIVES	RSPECTIVES
PeCDDs	2 :	0.997					
HxCDDs	2	1./4			N	2714 Exchange Drive	<u></u>
HpCDDs	.83		3.73			Wilmington	
TODE	S	1.97			2	North Carolina 28405	o.
PecDFs	2	. 83				5	
HXCDFs	1.69					Tel: 910 794-1613	
HpCDFs	1.86					Fax: 910 794-3919	
Total PCDD/Fs	18.3		21.5	!	е- п	e-mail: ytondeur@cs.com	шо
TEQ (ND=0)	0.200		1.5 2.68		wel	web: www.ultratrace.com	Eo
/===							

Reviewer Co Date 25 Ftb.01

Sample ID:	M23-1					Me	Method M23
Cilent Data		Sample Data		Laboratory Data			
Name:	PES	Matrix:	Air	Project No.:	P1388	Date Received:	6-Feb-01
Project ID: Date Collected:	F181.001 31-Jan-01	Weight/Volume:	-	Sample ID: OC Batch No:	P1388_275_001CU		8-Feb-01
Analyte	Conc.	DF	EMPC	Qualifler		Recoveries	10-0-1-65
	bd	pg	bd		SI	SS	AS
2,3,7,8-TCDD	S.	0.792			102	90	07.0
1,2,3,7,8-PeCDD	EMPC		1.74	۷	99.7	90.3	97.9
1,2,3,4,7,8-HxCDD	4.56			. ∢	104	1.10	97.9
1,2,3,6,7,8-HxCDD	7.58			< <	104	91.1	6.76
1,2,3,7,8,9-HxCDD	4.64			∢.	104	91.1	97.9
1,2,3,4,6,7,8-HpCDD	27.3			AB	96.5	90.3	97.9
ocpo	74.4			ΑB	83.6	90.3	6.76
2,3,7,8-TCDF	11.3				100	96.5	6 26
1,2,3,7,8-PeCDF	20.9			4	91.1	93.1	97.9
2,3,4,7,8-PeCDF	46.6			∢	91.1	93.1	97.9
1,2,3,4,7,8-HxCDF	48.9		:	AB	2.06	6.96	97.9
1,2,3,6,7,8-HxCDF	54.6				2.06	6.96	97.9
2,3,4,6,7,8-HXCDF	87.3	3		4	2.06	6.96	6.76
1,2,3,1,6,9-DXCUF	13.7			∢ (200	6.96	97.9
1.2,3,4,0,7,8-HPCDF	234 20 F			m •	98	90.3	97.9
OCDF	145		7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	∢	86	90.3	97.9
Totale & TEOs	2				5.10	90.3	97.9
TCDDs	17.3				ALTA A	ALTA ANALYTICAL PERSPECTIVES	RSPECTIVES
PeCDDs	41.3		48.5				
HXCDDS	68.2				27	2714 Exchange Drive	
HpCDDs	55.6					Wilmington	
TCDFs	345		010		Š	North Carolina 28405	
PecDFs	451		456			USA	
HxCDFs	517			-	I	Tel: 910 794-1613	
HpCDFs	370				· Œ	Fax: 910 794-3919	
Total PCDD/Fs	2090		2120		e-ma	e-mail: ytondeur@cs.com	Ę
TEO (ND=0)	50.7		51.5	TEF	web:	web: www.ultratrace.com	Ε
IEW (ND=DL/Z)	1.10		- : . I	1111			

Reviewer C人 Date 25 RPダロ

Sample ID:	M23-2					Met	Method M23
Client Data Name:	PES	Sample Data Matrix:	Air 1	Laboratory Data Project No.:	P1388	Date Received:	6-Feb-01
Project ID: Date Collected:	31-Jan-01	Weight Volume.	-	QC Batch No.:	275		14-FEB-01
Analyte	Conc.	D.	EMPC	Qualifier		Recoveries	
	Pg	bd	бd		SI	SS	AS
2,3,7,8-TCDD	0.945			АВ	86	102	86.2
1,2,3,7,8-PeCDD	2.44			∢	108	105	86.2
1,2,3,4,7,8-HxCDD	EMPC		1.96	∢ •	97.4	102	86.2
1,2,3,6,7,8-HxCDD	EMPC		5.04	∢ •	97.4	102	86.2
1,2,3,7,8,9-HxCDD	2.76		The state of the s	∀ ¥	97.4	102	86.2
осор	57.1			AB	91.3	104	86.2
2,3,7,8-TCDF	8.77			∢	94	102	86.2
1,2,3,7,8-PeCDF	15.2			4	95.4	105	86.2
2,3,4,7,8-PeCDF	36.1			∢	95.4	105	86.2
1,2,3,4,7,8-HxCDF	40			ΑВ	85.9	104	86.2
1,2,3,6,7,8-HxCDF	45.7			∢	85.9	104	86.2
2,3,4,6,7,8-HxCDF	73.7			<	85.0 0 0	104	86.2
1,2,3,7,8,9-HxCDF	11.1 906			< α	85.9	104	86.2
1,2,3,4,6,7,6-HPCDF	200			o ⊲	85.4	5 5	96.2
1,2,3,4,7,8,9-Hpcur OCDF	118			(88.0	401	86.2
Totals & TEQs							
TCDDs	13		15.6		WEIV !	ALIA ANALTIICAL PERSPECITVES	RSPECTIVES
HYCHOS	61.3 42.9		49.9		~	2714 Exchange Drive	g
HpCDDs	44.4					Wilmington)
						North Carolina 28405	15
TCDFs	265		Cac			OSA	
HXCDFs	441			12		Tel: 910 794-1613	
HpCDFs	328					Fax: 910 794-3919	
Total PCDD/Fs	1690		1710	. •	й-ө	e-mail: ytondeur@cs.com	mo:
TEQ (ND=0)	61.9	#1 13 13 14 2	42.6 42.6	11EF	We	web: www.ultratrace.com	Eo
I EG (ND=DL/Z)	D: +		14:0				

Reviewer Classification Date 25 Reb 61

C1

Sample ID:	M23-3					Mei	Method M23
Client Data		Sample Data		Laboratory Data			
Name:	PES	Matrix:	Air	Project No.:	P1388	Date Received:	6-Eah-01
Project ID:	F181.001	Weight/Volume:	-	Sample ID:	P1388_275_003	Date Extracted:	8-Feb-01
Date Collected:	1-Feb-01			QC Batch No.:	275	Date Analyzed:	14-FEB-01
Analyte	Conc.	70	EMPC	Qualifier		Recoveries	
	bd	bd	bd		SI	SS	AS
2,3,7,8-TCDD	Q	0.58	WE SELECTION		103	84	8 98
1,2,3,7,8-PeCDD	2	1.63			111	83.5	89.8
1,2,3,4,7,8-HxCDD	2.54			٧	102	84.1	89.8
1,2,3,6,7,8-HxCDD	4.63			٧	102	84.1	83.8
1,2,3,7,8,9-HxCDD	EMPC		2.25	∢	102	84.1	89.8
1,2,3,4,6,7,8-HpCDD	20.5			AB	103	85.7	89.8
OCDD	63.3			АВ	94.1	85.7	89.8
2,3,7,8-TCDF	7.39			∢	98.5	84	8 68
1,2,3,7,8-PeCDF	11.6			∢	. 66	83.5	86.8
2,3,4,7,8-PeCDF	26.5			∢	99.5	83.5	89,8
1,2,3,4,7,8-HxCDF	28.9			AB	90.2	82.3	89.8
1,2,3,6,7,8-HxCDF	35.5			∢	90.2	82.3	89.8
2,3,4,6,7,8-HxCDF	60.2				90.2	82.3	89.8
1,2,3,7,8,9-HxCDF	8.99			∢	90.2	82.3	89.8
1,2,3,4,6,7,8-HpCDF	172		:	В	87.7	85.7	89.8
1,2,3,4,7,8,9-HpCDF	18.8			⋖	87.7	85.7	89.8
OCDF	113				90.4	85.7	89.8
Totals & TEQs							
						•	
TCDDs	3.93		6.91		ALTA A	ALTA ANALYTICAL PER	PERSPECTIVES
recous	18.8						
HXCDUS	38.9		43		27	2714 Exchange Drive	
HpCDDs	41.5					Wilmington	
					ž	North Carolina 28405	
TCDFs	205					NSA	
PecDFs	277						
HXCDFs	345					Tel: 910 794-1613	
HpcDFs	274				ш	Fax: 910 794-3919	
Total PCDD/Fs	1380		1390		e-ms	e-mail: ytondeur@cs.com	E
TEQ (ND=0)	30.9		31.1	1 1 1 1	web:	web: www.ultratrace.com	Ε
2/10-01	0110		01.0	HEL			

Reviewer CL Bate 25 Rb ØL

ALTA ANALYTICAL PERSPECTIVES

PART 2

SAMPLE PATH

DOCUMENTATION FOR THE ANALYSIS

Щ С POLYCHLORINATED DIBENZO-PDIOXINS & DIBENZOFURANS

ALTA ANALYTICAL PERSPECTIVES

SAMPLE PATH

P1388 AAP PROJECT NO.: PROTOCOL: 23

SAMPLE PROCESSING

图 SDS 图 Extraction Standards (11C₁₁-PCDD / F) "IS "& "SS " Extraction

国 Injection Standards "RS" 国 HRGC/HRMS 国 12-H Performance Checks Multi-Column Cleanup (ASECS) Alternate Standards "AS " Final Extract D D D Analysis Fractionation 50 %

12-H Performance Checks Interpretation

E ID Criteria
E Detection Limits
E Recoveries Recoveries

DATA VALIDATION:

QC PROFILE

ONLY

OPR

FOR

100 PG (10 µL; 0.01 NG/µL)

SPIKE PROFILE

/4 NG (25 µL; 0.16 NG/µL) 4 NG (25 µL; 0.16 NG/µL) 2 NG (10 µL; 0.2 NG/µL)

AS & 55:

RS:

S.

ij

ALWAYS REQUIRED ALWAYS REQUIRED

OPR: LMB:

> AP-SP-CU AP-SP-A

FRACTIONATION:

ANALYSIS:

EXTRACTION:

AP-SP-E

SOPs

AP-SP-F AP-SP-R

AP-SP-N

CONCENTRATION:

FORTIFICATION:

REPORTING PLATFORM

PLATINUM Ξ LEVEL:

SAMPLE ANALYSIS

SAMPLE EXTRACTION

Malth

Solid

SDS

Split 1:

Archites

* ;

SPECIAL

FTRADECANE 13807 B REQUIREMENTS SUPPLIES IDS BASE SILICA ACID SILICA TOLUENE FLORISIL HEXANE CH2CL2 SILICA SAND 8 P.M. Blank Calibration -Standards Extract Report $g_{\mathcal{C}}$ 8 A.M. MS

\$10025110 020020

05/199

003597

ASECS

RSPI

YTIC.

1LTA

hrmsgenprepair.rpt

SAMPLE ALTA ANALYTICAL PERSPECTIVES

SAMPLE PATH

AAP PROJECT NO.: P1388
PROTOCOL: 23

COMMUNICATIONS

P 25Feb & (

Sample Inventory Report: MM5 Sampling Train

Project No.: P1388

Project Name: General Analytical HRMS

Date Rec.: 6-Feb-01

Lab. Sample ID	Collection Date	Clent Sample ID	Component ID
001	31-Jan-01 -	M23-1	Ace/Me
	31-Jan-01		Filter
	31-Jan-01		XAD
002	31-Jan-01	M23-2	Ace/Me
	31-Jan-01		Filter
	31-Jan-01		XAD
003	1-Feb-01	M23-3	Ace/Me
	1-Feb-01 /		Filter
	1-Feb-01		XAD
004	1-Feb-01	Reagent Blk	Ace/Me
	1-Feb-01	1080	Toluene
	1-Feb-01		XAD

eh Light

PROCESS SHEET

Project No.-AR:

P1388-1 of 1

Project Due:

2/27/01

Client:

Pacific Environmental Services (PAENC01A)

TAT:

21

Client Manager:

Yves Tondeur

Extraction Due:

3/2/01

Method: EPA Method 23 Extraction Type: EPA Method 23

Matrix: Split Type:

MM5 1:2

Component: PCDD/F (Tetra - Octa)

LabID	Client-ID	Component Type	Client Component ID	Date Receiv	ed SLoc
001	M23-1	Filter#1 Solvent#1 XAD#1	Filter Ace/Me XAD	2/6/01 2/6/01 2/6/01	F-2 F-2 F-2
002	M23-2	Filter#1 Solvent#1 XAD#1	Filter Ace/Me XAD	2/6/01 2/6/01 2/6/01	F-2 F-2 F-2
003	M23-3	Filter#1 Solvent#1 XAD#1	Filter Ace/Me XAD	2/6/01 2/6/01 2/6/01	F-2 F-2 F-2

Instructions:	 			
		•		

Report Options

Report Level: 1

EDD Type:

Vial Box ID:

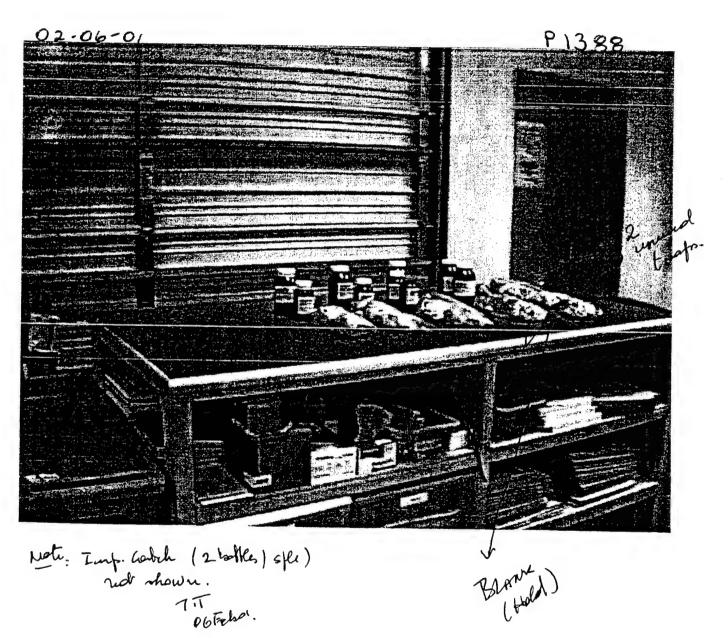
Date Requested:

2/20/01 HRMSAirAR.rpt

PACIFIC ENVIRONMENTAL SERVICES, INC.

Central Park west 5001 South Miami Boulevard, P.O. Box 12077 Research Triangle Park, North Carolina 27709-2077 (919) 941-0333 FAX: (919) 941-0234

				Chain of Ct	of Custody Record	ecord					
Project Numb	F181.001	Project Name		Andrews AFB Medical Waste Incinerator			Ana	Analysis Requested	_		
Samplers: DC) Holzschuh	DD Holzschuh, J Falank, MD Maret	Maret							E S	
Date	Time	Field Sample ID	Ol elqt	Sample Description		CDD	CDE				
1/31/01	1000	1000 M23-1-1	,	Filter, dry							
1/31/01	1000	1000 M23-1-2	`	XAD Sorbent Module			-				
1/31/01	1000	1000 M23-1-3	,	Front Half Back Half Acetone/Toluene rince	ene rince						
1/31/01	1000	1000 M23-1-4A	١	Impinger Contents Fraction 1							,,
1/31/01	1000	1000 M23-1-4B	١				-				i. An i' de ti
1/31/01	1500	1500 M23-2-1	\	Filter, dry							edit it
1/31/01	1500	1500 M23-2-2	`	XAD Sorbent Module							مد الد
1/31/01	1500	1500 M23-2-3	`	Front Half Back Half Acetone/Toluene rince	ane rince						
1/31/01	1500	1500 M23-2-4A	١	Impinger Contents Fraction 1							
1/31/01	1500	1500 M23-2-4A	>								-
2/1/01	0060	0900 M23-3-1	٥	Filter, dry							
2/1/01	0060	0900 M23-3-2	۲	XAD Sorbent Module							
2/1/01	0060	0900 M23-3-3	7	Front Half Back Half Acetone/Tolu	ne/Toluene rince						. 7
2/1/01	0060	0900 M23-3-3A	木	Front Half Back Half Acetone/Toluene rince	ne rince	•			1	F. 8570 Lat Could (23.3	TH(BH
2/1/01	0060	0900 M23-3-4A	1	Impinger Contents Fraction 1							NIT.
2/1/01	0060	0900 M23-3-4B	١	Impinger Contents Fraction 2		•					
2/1/01	1400	1400 M23-B-2	,	XAD Sorbent Module					Archive	ive	
2/1/01	1400	1400 M23-DI		HPLC Water Reagent		•			Archive	ive	
2/1/01	1400	1400 M23-A	٠	Acetone Reagent Blank		•			Archive	ive	
2/1/01	1400	1400 M23-T		Toluene Reagent Blank		•	•		Archive	ive	
Relinguished by:	(Signature)	1	Date/Time 2/6/cd (C20	Received by (Signalule)	Relinguiened by		enter de la compunió y la pays		Date Time Receiv	Received by (Signature)	
Relinquished by: (Signature)	(Signature)		Date Time 3 - 5 - 0 /	Received by: (Signifiturie) Re	Reliriquished by: (Signature)	(Signatu	æ.	Date	Date/Tilme Recel	Received by: (Signature)	
Relinguished by: ((Signature)	- 76	Date/Time ($\frac{1}{2}$	d for lab by: (Signature)	REMARKS						
 -										rage.	



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STANDARD OPERATING PROCEDURE



Attachment 1

ALTA ANALYTICAL PERSPECTIVES Project No.: P 1388

_			
	Sample Log-In Checklist	Yes	No
1.	Date Samples Arrived: 02 - 06 - 07 Initials: 34		
2.	Time / Date logged in: 1:38 62-66-6/ Location F - 2 Initials	:: 3 4	
3.	Samples Arrived By: (circle one) Airborne Express Federal Express UPS Freezer Truck Company Courier DHL Other	Emery	
4.	Shipping Preservation: (circle) lce / Blue lce / Dry lce None Temp °C /96		
5.	Shipping Documentation Present? (circle one) Shipping Label		
	Airbill Tracking Number		
6.	Shipping Container(s) Intact? If no, describe condition below.	/	
7.	Container Custody Seals Present and Intact? If not intact, describe condition below.		_
8.	Sample Custody Seals Present and Intact? If not intact, describe condition below.		
	No. of Seals or Seal No.		
9.	Sample Container Intact? If no, indicate sample condition below.		
10.	Chain of Custody (COC) or other Sample Documentation Present?		
11.	COC/Documentation Acceptable? If no, complete COC Anomaly Form.	/	
12.	Shipping Container: (circle) ALTA NALYTICAL PERSPECTIVES Return or Retain	in) or [Dispose
	Client Return or Retain or Dispose		
13.	Container and/or Bottles Requested?		
14.	Sample Control Check In/Out Log Completed?	/	
15.	Drinking Water Sample? If yes, Acceptable Preservation? (circle) Y or N		
16.	Imported Soil? If yes, apply appropriate label.		
Nar	Date Samples Reconcile	ed:	

Comments:

	1	<u> </u>		>
	Page 1 of 1	Acq time		13:52:50
		Analyst Acq date	14-FEB-01 14-FEB-01 14-FEB-01 14-FEB-01 14-FEB-01 14-FEB-01 23-FEB-01 23-FEB-01	23-FEB-01
	GC Column ID: db-5	Analyst	GAG GAG GAG GAG GAG GAG GAG GAG	GAG
Page 1	Run file: 010214P1	Sample ID (Chrom. Text)	DB5 CPSM / M23 CS3 — G 0 275 OPR001 — G 0 275 MB001 — G 0 275 MB001 — G 0 275 MB001 — G P1388 275 001 M23-1 Air Train D10 Processed G P1388 275 003 M23-2 Air Train — G P1388 275 003 M23-3 Air Train — G DB5 CPSM / M23 CS3 — G SOLVENT BLANK G P1388 275 001 M23-1 Air Train CU — G G G SOLVENT BLANK G G G G G G G G G G G G G G G G G G G	DB5 CPSM / M23 CS3
OPUSquan 23-FEB-2001 15:57	Alta Analytical Perspectives - Injection Log	Vial# Lab ID	3 CS3RC — 76 0_275_OPR001 — 77 0_275_MB001 — 78 P1388_275_001D10	3 CS3RC
23-FE	ytical	*S		4
OPUSquan	Alta Anal	Data file	010214P1 010214P1 010214P1 010214P1 010214P1 010214P1 010223P1 010223P1	01022371

OPUSquan 23-FEB-2001 15:57

resolution plot for function Sofr Gson 14 Rebbl not printed (Slos communication 10st while centrolding function 5 - System had to rebooked)

ALTA ANALYTICAL PERSPECTIVES

PART 3

ANALYTICAL RESULTS

DOCUMENTATION FOR THE ANALYSIS

L T POLYCHLORINATED DIBENZO-PDIOXINS & DIBENZOFURANS

Sample ID:	0_275_MB001	100				Mo	Mothod May
Client Data		Sample Date		1 - 1 - 1		DIAI	CAIN DOIN
Name:	DHQ.	Matrix:	;; •	Laboratory Data			
Project ID:	F181.001	Weight/Volume:	Alf -	Project No.:	P1388	Date Received:	п/а
Date Collected:	n/a		-	QC Batch No.:	0_2/5_MB001	Date Extracted:	8-Feb-01
Analyte	Conc.	DL	EMPC	Qualifier		Recoveries	14-120-01
	bd	pg	Đơ.		S	00	
2,3,7,8-TCDD	EMD					3	AS
1.2.3.7.8-PeCnn	ביים ביים		1.29	X	9.66	98.2	85.4
1.2.3.4.7.8-HxCDD		0.997			100	96.4	85.4
1.2.3.6.7.8-HxCDD	2 2	20.			100	97.1	85.4
1,2,3,7,8,9-HxCDD	€ €	1.87			100	97.1	85.4
1,2,3,4,6,7,8-HpCDD	Q W L	1.58			100	97.1	85.4
OCDD	רואון ס כי		1 .0	∢	100	99.1	85.4
	6.7			Y	95.7	99.1	85.4
2,3,7,8-TCDF	QN	1 27					
1,2,3,7,8-PeCDF	S	184			100	98.2	85.4
2,3,4,7,8-PeCDF	S	10.1			93.6	96.4	85.4
1,2,3,4,7,8-HxCDF	9 -	9			93.6	96.4	85.4
1,2,3,6,7,8-HxCDF	S	0 559		∢	86.5	97.3	85.4
2,3,4,6,7,8-HxCDF	2	0.586			86.5	97.3	85.4
1,2,3,7,8,9-HxCDF	S	0.000			86.5	97.3	85.4
1,2,3,4,6,7,8-HpCDF	1.86	200			86.5	97.3	85.4
1,2,3,4,7,8,9-HpCDF	S	- 5 N2		◀	88	99.1	85.4
OCDF	2	2.83			88	99.1	85.4
Totals & TEQs					91	99.1	85.4
					4		
CDDs	2		1.29		ALTA A	ALTA ANALYTICAL PER	DEBSECTIVES
Pecoos	2	0.997					
2	Q	1.74			7.6	2714 Exchange Drive	
SOOOdu .	1.83		3.73		i	Wilmington	
TCDFs					No	North Carolina 28405	
Pecdes	2 5	1.83				USA	
HxCDFs	1.69	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3					
HpCDFs	1.86				- ι	Tel: 910 794-1613	
Total PCDD/Fs	18.3		21.5		T W	Fax: 910 794-3919	
TEQ (ND=0)	0.200		1.5	ITEF	weh:	web: www.ultratrace.com	 E (
ובת (אח=חר/2)	1.38		2.68	ITEF		www.ditalace.com	=

Reviewer *Q*Date 25 Rb ØL

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	Page 3 of 3			,	٥	Kevlewer:	ノロトレス	מבו רבו																																	777	Analyst: 0/6	. 1	122/26/01			
	010214P1- 010214P1-	\				Kevi		Date										EMPC	1.29	•	*	3.73	*	*	•	0.00	1.09	٦ ;	99.61		100	1001	95.7	1001	93.6-	86.5		91.0 /		1 1			98.2	96.4	97.3	99.1	85.4
	ConCal: EndCal:	DL 0.685	· ·	٦.		-	8		ч.	г.					•	. 2	2.83		0.685	Ö	_		-	~	1.83	0	1 86	1.00																			
	000	noise Fac 837 2.5	596 2.5	4 (4 (4 (700 2.5		1614 2.5	2	N (700 7 5	4 0	4 6	4 0	1 0	962 2.5		837 2.5		1072 2.5	~	~	1804 2.5	1607 2.5	•	1564 2 5	204 7																			
\	12:49:16 wt/vol: 1	if. CDE																															•												•		
\	3 Acq: 14-FEB-01 ICal: MM1_M23_0*	Conc Qualif	1.) !	١.	1.90	. 7		* •	* ·		1.69		. •	1.86	•	•		*	*	*	1.83	*	4 .	* 6	0.00	1.09		1980	4010	4000	4010	3830	4000	3740	3460	3520	3640	000	4000	4000		3930	0820	3890	3970	3420
	S: 3 ICa	RT 27:45	NotF.	Notr	NOTE:	NOTE:	46:51		NotF	NotF	Notr	30:08	Note:	NOLF.	30.53	Notes	NotF		NotF.	NotF.	NotF.	40:19	NotF	NotF	NotF		30108	20162	27:43	33:11	37:12	41:30	46:50	26:50	31:42	36:15	39:52	47:09		25.28	37:31		27:45	32150	36:06	42:19	37:55
1	010214P1 ID: db-5	RRF 1.26	1.01	1.14	70.1	1.14	1.03		1.05	1.04	1.05	1.13	1.24	1.10	1.54	1.30	1,15		1.26	1.01	1.10	1.13	1.05	1.05	1.05	:	1.14	1.42	1,13	0.93	0.93	0.91	0.73	1.06	96.0	1.28	0.00	0.81		00.1	1.00		0.51		0.91	0.85	1.07
Page	Filename: 01 GC Column II	RA 0.39/n) <u>. </u>	د : • •	E .	4 4 4 E)		*	# ·		1.13 ye		= f	1 00 1		*	:	*	#	# #	1.04 y		E	۵ *		1.13 y	1.05 y	70 07	1.58 V				0.77 y			0.44 y			/X 6/.0	1.26 ×	•		1.55 Y		0.43 Y	
	Ff	Resp 2.88e+04	*	•			1.23e+05		*	*	•	2.81e+04	• •	•	3 020+04	* *	*		*	*	*	2.49e+04	*	*	*		2.81e+04	3.02e+04	7 110+07	5.84e+07	4.96e+07	4.82e+07	3.73e+07	8.92e+07	7.53e+07	5.89e+07	4.22e+07	3.92e+07	101000	6.29e+07	5.31e+07		3.59e+07	7.06e+07	5.21e+07	3.57e+07	4.85e+07
1 23-FEB-2001 19:34	Client ID: 0_275_MB001 Lab ID: 0_275_MB001	Name 2,3,7,8-TCDD	1,2,3,7,8-PeCDD	1,2,3,4,7,8-HxCDD	1,2,3,6,7,8-HxCDD	1,2,3,7,8,9-HXCDD	GCDD OCCDD		2,3,7,8-TCDF	1,2,3,7,8-PeCDF	2,3,4,7,8-PecDF	1,2,3,4,7,8-HXCDF	1,2,3,6,7,8-HXCDF	2,3,4,0,/,0-EXCUE	1 2 3 4 6 7 B-BACDE	1.2.3.4.7.8.9-HDCDF			Total Tetra-Dioxins	Total Penta-Dioxins	Total Hexa-Dioxins	Total Hepta-Dioxins	Total Tetra-Furans	1st Fnc. Penta-Furans	Total Penta-Furans	PeCDF Totals:	Total Hexa-Furans	Total Hepta-Furans	13C-2 3 7 8-#CDD	13C-1.2.3.7.8-PACDD	13C-1,2,3,6,7,8-HxCDD	13C-1,2,3,4,6,7,8-HpCDD	13C-0CDD	13C-2,3,7,8-TCDF	13C-1,2,3,7,8-PeCDF	13C-1,2,3,6,7,8-HxCDF	13C-1,2,3,4,6,7,8-HpCDF	13C-OCDF		13C-1, 2, 3, 4-TCDD	13C-1,2,3,4=1CDF		37C1-2,3,7,8-TCDD	13C-2, 3, 4, 7, 8-PecDF	13C-1,2,3,4,7,8-EACDE	13C-1,2,3,4,7,8,9-HpCDF	13C-1,2,3,7,8,9-HxCDF
OPUSquan	Clier Lab 1																							•••					ŭ	S +	SI			IS	IS			IS	100	RS/RT	RS/RT		PS	ខ្លួ			

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OPUSquan 23-FEB-2001 19:26 Page 1	
	Page 2 of 18
Totals class: TCDD EMPC File Name: 010214P1 Sample #: 3 Sample text: 0_275_MB001	
Acquired: 14-FEB-01 12:49:16 Processed: 20-FEB-01 12:06:57	
Total Conc.: 1.2852 Unnamed Conc.: *	
RT ml Resp mod. m2 Resp mod. RA Resp Adj_Resp S/N	Conc. Name
27:45 1.254e+04 y 3.230e+04 n 0.39(n 3.484e+04 2.882e+04 1.07e+01 y	1.29 2,3,7,8-TCDD Page 4 of 18
Totals class: PeCDD EMPC Function: 2 Run #: 10 File Name: 010214P1 Sample #: 3 Sample text: 0_275_MB001	
Acquired: 14-FEB-01 12:49:16 Processed: 20-FEB-01 12:06:57	
Total Conc.: * Unnamed Conc.: *	
RT ml Resp mod. m2 Resp mod. RA Resp Adj_Resp S/N	Conc. Name
NotF: *n *n *n * n	
Totals class: HxCDD EMPC Function: 3 Run #: 10 File Name: 010214P1 Sample #: 3 Sample text: 0_275_MB001	rage b of 18
Acquired: 14-FEB-01 12:49:16 Processed: 20-FEB-01 12:06:57	
Total Conc.: * Unnamed Conc.: *	
RT ml Resp mod. m2 Resp mod. RA Resp Adj_Resp S/N	Conc. Name
NotF, *n *n * n	* Page 8 of 18
Totals class: HpCDD EMPC Function: 4 Run #: 10 File Name: 010214Pl Sample #: 3 Sample text: 0_275_MB001	
Acquired: 14-FEB-01 12:49:16 Processed: 20-FEB-01 12:06:57	
Total Conc.: 3.7295 Unnamed Conc.: 1.832	
RT ml Resp mod. m2 Resp mod. RA Resp Adj_Resp S/N	Conc. Name
40:19 1.273e+04 y 1.221e+04 y 1.04 y,2.494e+04 2.494e+04 2.95e+00 y 41:31 1.854e+04 y 1.266e+04 y 1.46 m 3.120e+04 2.583e+04 2.38e+00 n	1.83 1.90 1,2,3,4,6,7,8-HpCDD Page 10 of 18
Totals class: TCDF EMPC Function: 1 Run #: 10	

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OPUSquan 23-FEB-2001 19:26 Page 2	
File Name: 010214Pl Sample #: 3 Sample text: 0_275_MB001	
Acquired: 14-FEB-01 12:49:16 Processed: 20-FEB-01 12:06:57	
Total Conc.: * Unnamed Conc.: *	
RT ml Resp mod. m2 Resp mod. RA Resp Adj_Resp S/N Conc. Name	
NotF* * n * n * n *	Page 12 of 18
Totals class: 1st Fnc.PeCDF EMPC Function: 1 Run #: 10 File Name: 010214Pl Sample #: 3 Sample text: 0_275_MB001	•
Acquired: 14-FEB-01 12:49:16 Processed: 20-FEB-01 12:06:57	
Total Conc.: * Unnamed Conc.: *	
RT ml Resp mod. m2 Resp mod. RA Resp Adj_Resp S/N Conc. Name	
NotF, *n *n *n * n *	Page 14 of 18
Totals class: PeCDF EMPC Function: 2 Run #: 10 File Name: 010214Pl Sample #: 3 Sample text: 0_275_MB001	
Acquired: 14-FEB-01 12:49:16 Processed: 20-FEB-01 12:06:57	
Total Conc.: * Unnamed Conc.: *	
RT ml Resp mod. m2 Resp mod. RA Resp Adj_Resp S/N Conc. Name	
NotF, * n * n * n * 1,2,	* 1,2,3,7,8-PeCDF Page 16 of 18
Totals class: HxCDF EMPC Function: 3 Run #: 10 File Name: 010214Pl Sample #: 3 Sample text: 0_275_MB001	
Acquired: 14-FEB-01 12:49:16 Processed: 20-FEB-01 12:06:57	
Total Conc.: 1.6885 Unnamed Conc.: *	
RT m1 Resp mod. m2 Resp mod. RA Resp Adj_Resp S/N Conc. Name	Q1
36:08 X.490e+04 y 1.322e+04 y 1.13 y/2.813e+04 2.813e+04 5.10e+00 y 1.69 1,2,	1.69 1,2,3,4,7,8-HxCDF Page 18 of 18
Totals class: HpCDF EMPC Function: 4 Run #: 10 File Name: 010214Pl Sample #: 3 Sample text: 0_275_MB001	
Acquired: 14-FEB-01 12:49:16 Processed: 20-FEB-01 12:06:57	

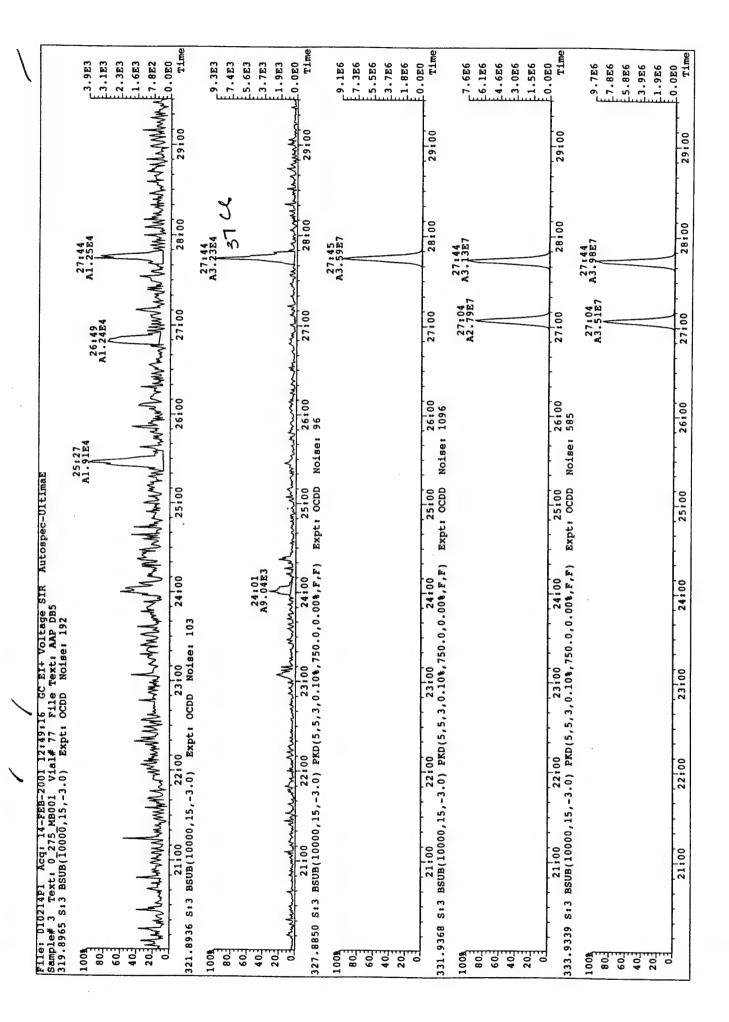
		Conc. Name	n 1.86 1.2.3.4.6.7.8-HPCDF
			1 00
		S/N	2.35e
		Resp Adj_Resp S/N	e+04
	:	Adj	3.023
Page 3	Unnamed Conc.: *	Resp	39:53 X.546e+04 y 1.477e+04 y 1.05 y X.023e+04 3.023e+04 2.35e+00 n
	5	\$	1.05 3
		pow d	Α.
9:26		n2 Rea	177e+0
001 1	8583	mod.	у 1.
-FEB-	Total Conc.: 1.8583	RT ml Resp mod. m2 Resp mod. RA	Se+04
23	1 Con	m1	1.54
OPUSquan 23-FEB-2001 19:26	Tota	RT	39:53

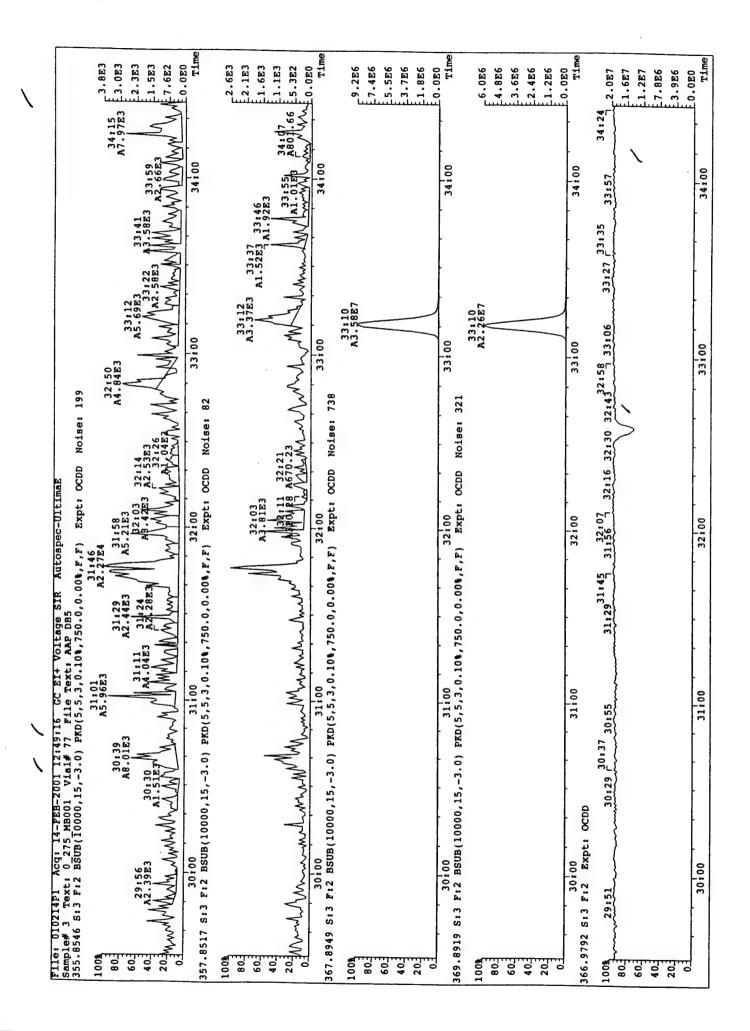
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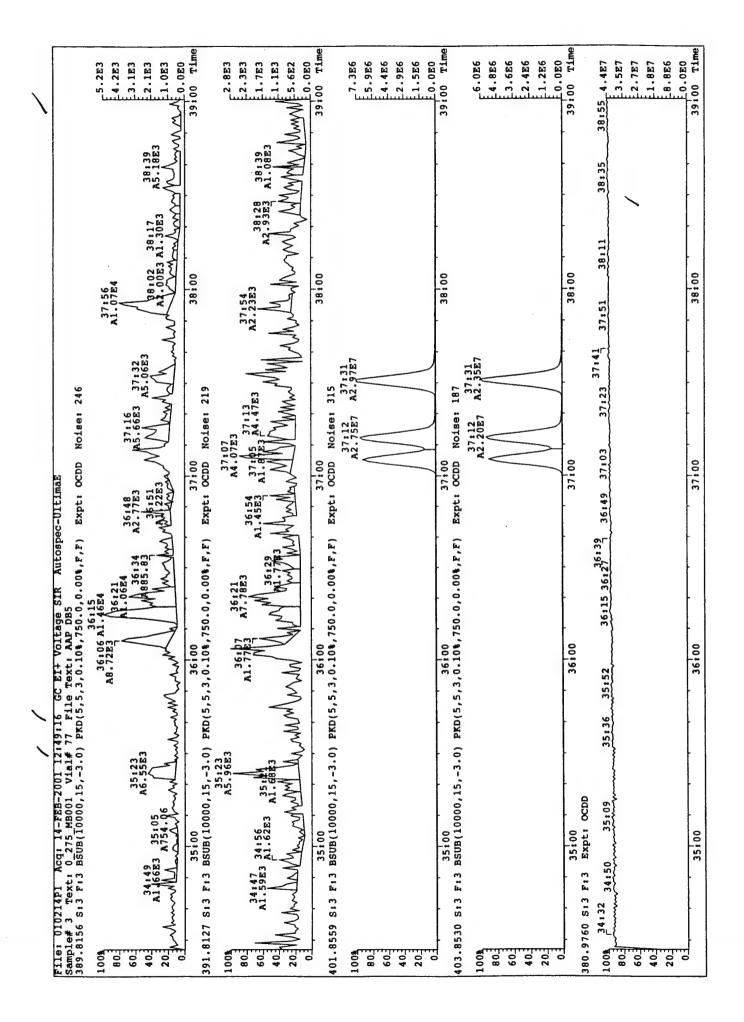
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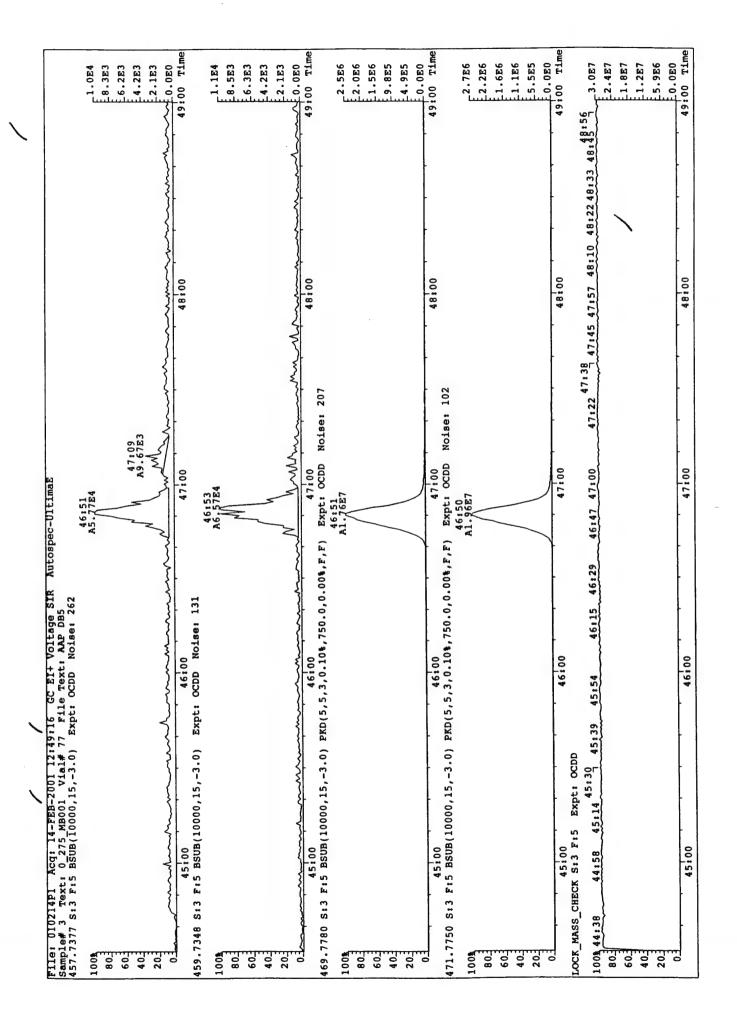
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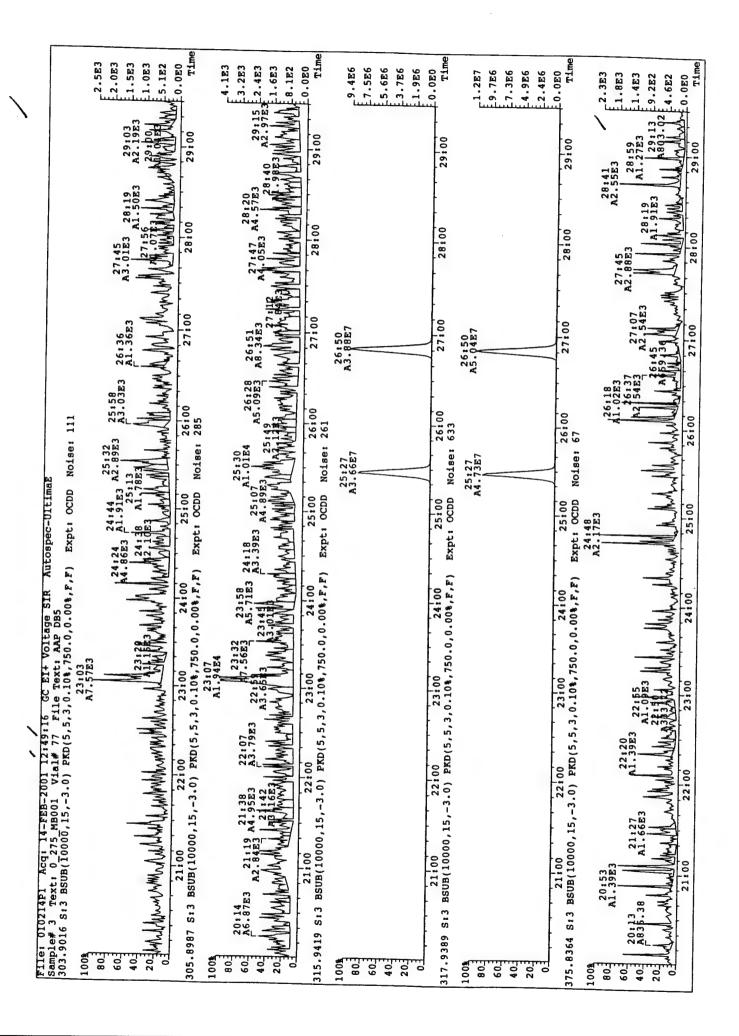
.4

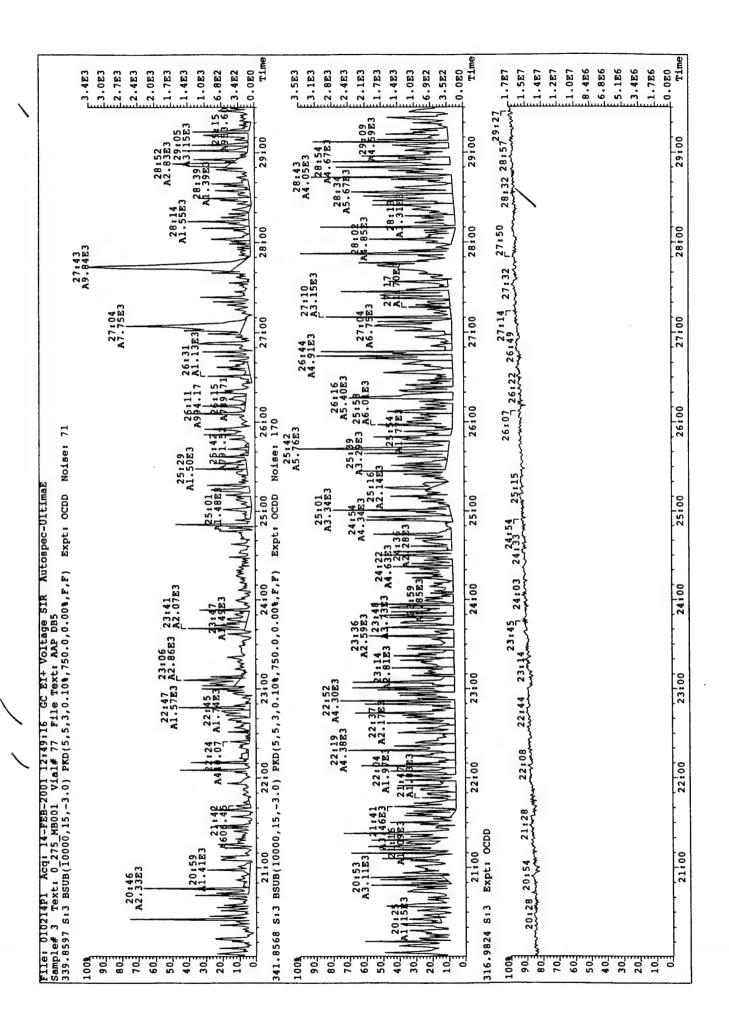
* or. **

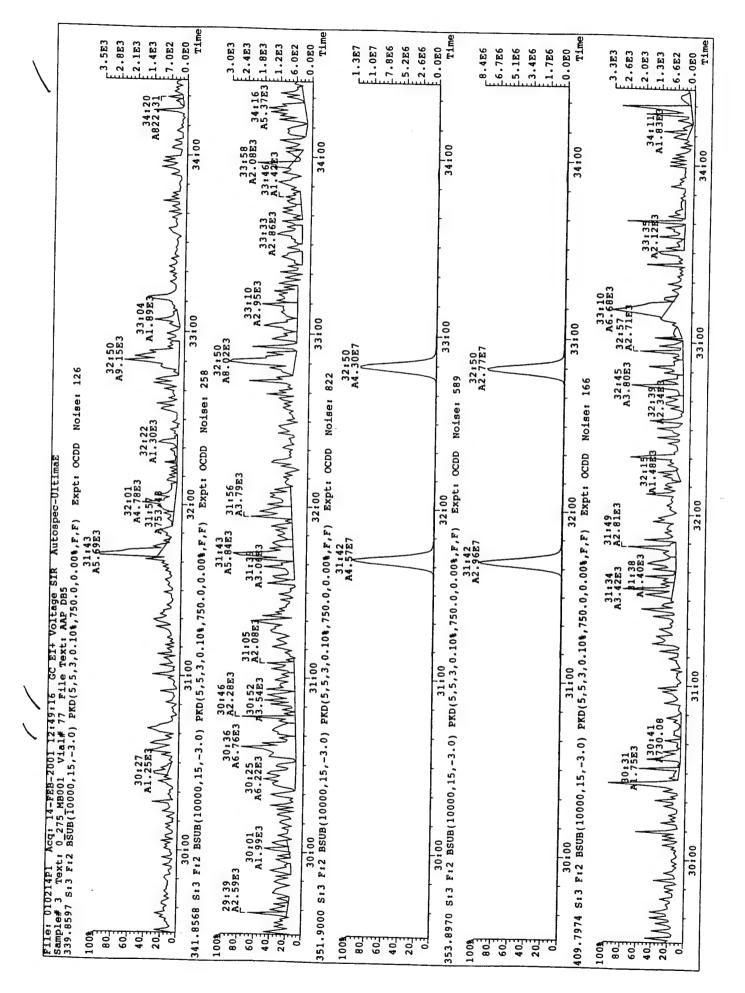
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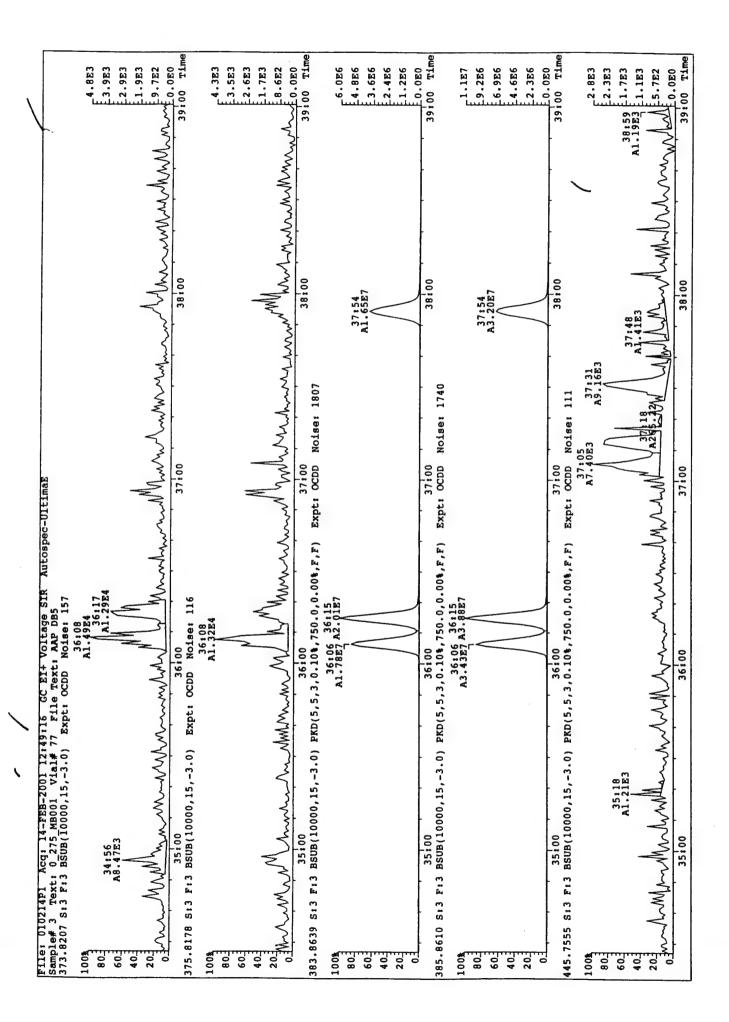
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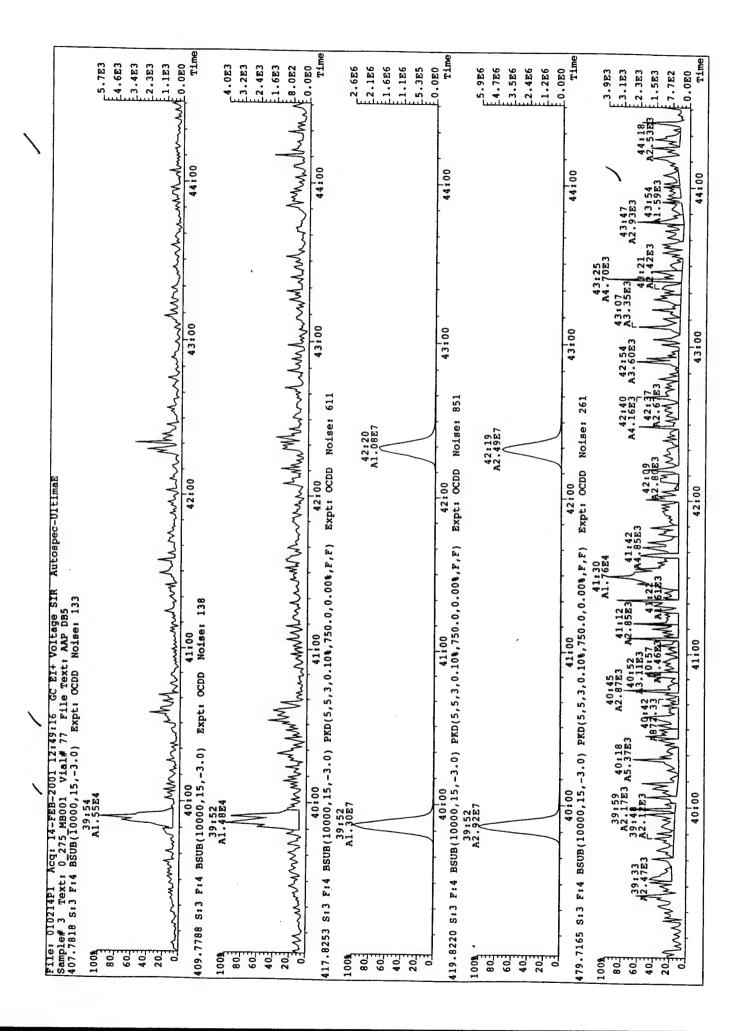












⊏.	ImaE
Sample# 3 Text: 0 275 MB001 V1al# // File Text: AAF D5 441.7428 S:3 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,750.0,0.00%,F,F) Exp	Expt: OCDD Noise: 118
#00	47110 A2.0454
	11 2.9 53
	aid.
46138 403 A1.35E3 46153	47W62 1 47
A ANS WAS ASSESSED ASSESSED AND AND AND AND AND AND AND AND AND AN	AN 18.9 WAI : 1783 A WAY
45,00	49:00 49:00 Time
443.7398 S:3 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,750.0,0.00%,F,F) Expt:	OCDD Noise: 178
	47:10 81 7284
100	
00	
AE.00 AE.10 AE.40	47:15 47:35 47:46 13:25 48:25 48:46
44:53 44:32E3 A1:48E3 A4:48E3 AP:65E3 A3:40E3	A5.18E3 A1.60E3 A1.32E3 A2.53E3
My My My My Man Man Man Man Man Man Man Man Man Man	Mrry 1 1 2 1 2 MM rand man Mark May Washing 0.000
l	
B(10000,15,-3.0) PKD(5,5,3,0.10%,750.0,0.00%,F,F)	Expt: OCDD Noise: 95
	47109 Al.84E7
	(5.156
	11.656
202	
	0.0
45:00 45:00 46:00 46:00 46:00 EXDE:	447:00 48:00 48:00 Time 49:00 Time
(- 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	478
100%	
708	1.956
100	1.256
202	(9.02)
0	47:00 48:00 49:00 Time
08,750.0,0.00%,F,F)	Noise: 82
401.53 100k	F1.7E3
8008	47:06 1.4E3
2003 MARA MARKANALLAN CHAMMANAMANAMANAMANAMANAMANAMANAMANAMANAM	my my my month was and my man and my man 3.422
45:00	49:

Sample ID:	M23-1						7011
Cilent Data		Sample Data		I oberes		ME	Method M23
Name: Project ID:	PES F181,001	Matrix:	Air	Project No.:	P1388	Date Received:	6-Feb-01
Date Collected:	31-Jan-01			Sample ID: QC Batch No.:	P1388_275_001CU Date Extracted: 275 Date Analyzed:	Date Extracted:	8-Feb-01
Analyte	Conc.	DF	EMPC	Qualifier		Becoveries	23-FEB-01
	bd	pg	bd		S	Societa	0.4
2,3,7,8-TCDD	Q	607.0			2	200	AS
1,2,3,7,8-PeCDD	EMPC	70.10	1.77		102	96.5	97.9
1,2,3,4,7,8-HxCDD	4.56				99.7	93.1	6.76
1,2,3,6,7,8-HxCDD	7.58			C <	40.	91.1	6.76
1,2,3,7,8,9-HxCDD	4.64			< <	400	91.1	97.9
1,2,3,4,6,7,8-HpCDD	27.3			A A	104 06 F	91.1	97.9
	74.4			AB	83.6	90.00 80.00	97.9
2,3,7,8-TCDF	7					0.00	6.78
1,2,3,7,8-PeCDF	5.00				100	96.5	6.26
2,3,4,7,8-PeCDF	46.6			∢ :	91.1	93.1	97.9
1,2,3,4,7,8-HxCDF	48.9			۷ ;	91.1	93.1	97.9
1,2,3,6,7,8-HxCDF	54.6			o V	90.7	6.96	6.76
2,3,4,6,7,8-HxCDF	87.3				90.7	6.96	97.9
1,2,3,7,8,9-HxCDF	13.7				90.7	6.9	97.9
1,2,3,4,6,7,8-HpCDF	234			ζ α	7.06	96.9	6.76
1,2,3,4,7,8,9-HpCDF					ည္ မွ	600.3	97.9
UCDF	145				21.3	90.00 00.00	97.9
l otals & TEOs					0.10	90.3	97.9
TCDDs	0 1						
Pecdos	5.74		ů,		ALTA AN	ALTA ANALYTICAL PER	PERSPECTIVES
HxCDDs	68.2					1	
НрСDDs	55.6				271	2714 Exchange Drive	
						vviimington	
PecDFs	345		370			USA	
HxCDFs	517		420				
HpCDFs	370				- L	lel: 910 794-1613	
TEO (ND-0)	2090		2120		e-mail	rax: 910 794-3919 6-mail: vtondeur@cs.com	
TEQ (ND=DL/2)	51.1		51.5	ITEF	web: v	web: www.ultratrace.com	
			8.1c	ITEF			

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						Reviewers		Date									EMPC	7.3	3.5	3.2	9	270		. u	517	-												,	Analyst:		ate			
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Sal.	Cal.	DI	7 / 7	1.30	1.45	6.1	2.16	ŗ		6		27.7	893	.02		1.32	*	792	. 70	. 35	.16	11	3,50	,	91	.20																		
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	000.	noise F	1	9	6	6	12	0	15	18	18	12	12	12	12	12	1	111	11	96	12	15	4 -	Ö	12	120																		
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		Conc		4	7	4.	74	r	= :	0 1	90	0 4	87	3	2	26.	4	7	_	œ 1	55.	£ 4	40.4	1, 4 2 ft	517	37		325	332	3090	268	320	2900	275	9	320	3200	320	309	298	291	2890	313	
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	Cal	RH	. (*)	: =	8	@ \	o w	2	80	<u>ن</u> و	9 6	· -	! =	ņ	6 0 1	ر د م		00	y ·	σ,	ın v	ه د	۰ د	4	0	89		- 4	. .	2	4 (χο α		7	m	-	S	9	7	20	۰ ۵	4.	0	
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Sample text: P1388_275_001 M23-1 Air Train CU
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Sample text: P1388_275_001 M23-1 Air Train
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Sample text: P1388_275_001 M23-1 Air Train
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                                              EMPC
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File Name: 01022391
                                                                                                         Total Conc.: 17.275
 25-FEB-2001
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35:58 1.502e+05 y
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36:23 2.866e+04 y
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25:50 4.864e+04
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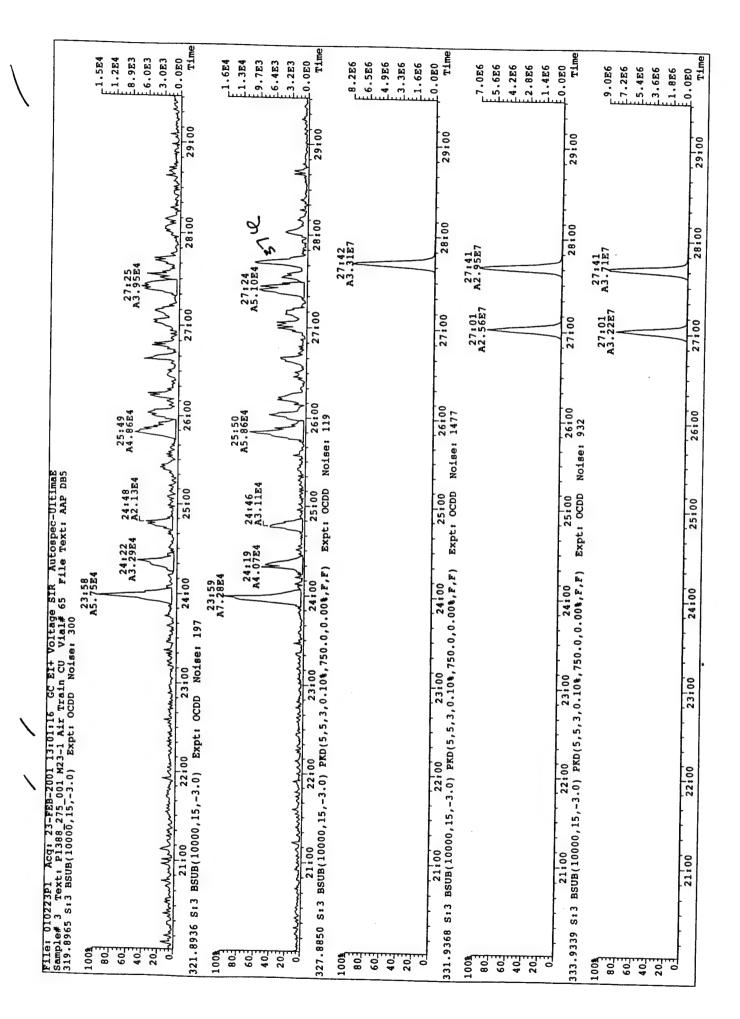
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                                                                                                                                                                                                                                                                  27.3 1,2,3,4,6,7,8-HpCDD
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                      7.58 1,2,3,6,7,8-HxCDD
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Sample text: P1388_275_001 M23-1 Air Train CU
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0.71 y 2.821e+05 2.821e+05
0.70 y 5.612e+05 5.612e+05
0.80 y 6.090e+05 6.090e+05
0.64 (1.4.994e+05 4.489e+05
0.69 y 7.093e+05 3.093e+05
0.74 y 7.045e+06 1.045e+06
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   5 y 2.192e+05 2.192e+05 2 y 3.794e+05 3.794e+05 4 y 1.142e+06 1.142e+06 6 y 7.634e+05 7.634e+05
                                                                                                                                                                                                                                                      40:15 J.979e+05 n 1.927e+05 n 1.03 a 3.906e+05 3.906e+05 41:26 1.957e+05 n 1.804e+05 n 1.09 y 3.761e+05 3.761e+05
                     37:08 6.002e+04 y 4.510e+04 y 1.33 y 4.051e+05 1.051e+05 37:21 3.341e+04 y 3.075e+04 y 1.09 y 6.416e+04 6.416e+04 37:28 4.083e+04 n 3.114e+04 y 1.31 y 7.197e+04 7.197e+04
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A1.815e+05 1.628e+05
y2.402e+05 2.402e+05
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0.79 y-6.894e+04 6.894e+04
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23:32 4.850e+05 y
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26:42 1.953e+05 y
26:48 1.266e+05 y
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27:43 3.046e+04 n
28:51 3.107e+04 y
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25:03 1.299e+05
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26:23 2.310e+05
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                                                                                     Conc. Name
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1.59 y 1.051e+05 1.051e+05
1.50 y 4.933e+05 1.933e+05
1.46 y 3.129e+05 3.129e+05
1.49 y 1.387e+06 1.387e+06
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1.30 y 4.543e+05 1.543e+05
1.28 y 1.141e+06 1.141e+06
1.18 y 8.988e+05 8.988e+05
1.25 y 4.099e+06 1.099e+06
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1.50 y/1.394e+06 1.394e+06
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y 2.314e+05 2.214e+05
                                             Unnamed Conc.: 46.757
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 25-FEB-2001 14:26
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                                           Total Conc.: 46.757
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35:30 2.724e+04 n
35:56 6.400e+05 n
36:03 4.868e+05 n
36:11 6.100e+05 n
36:21 1.094e+05 n
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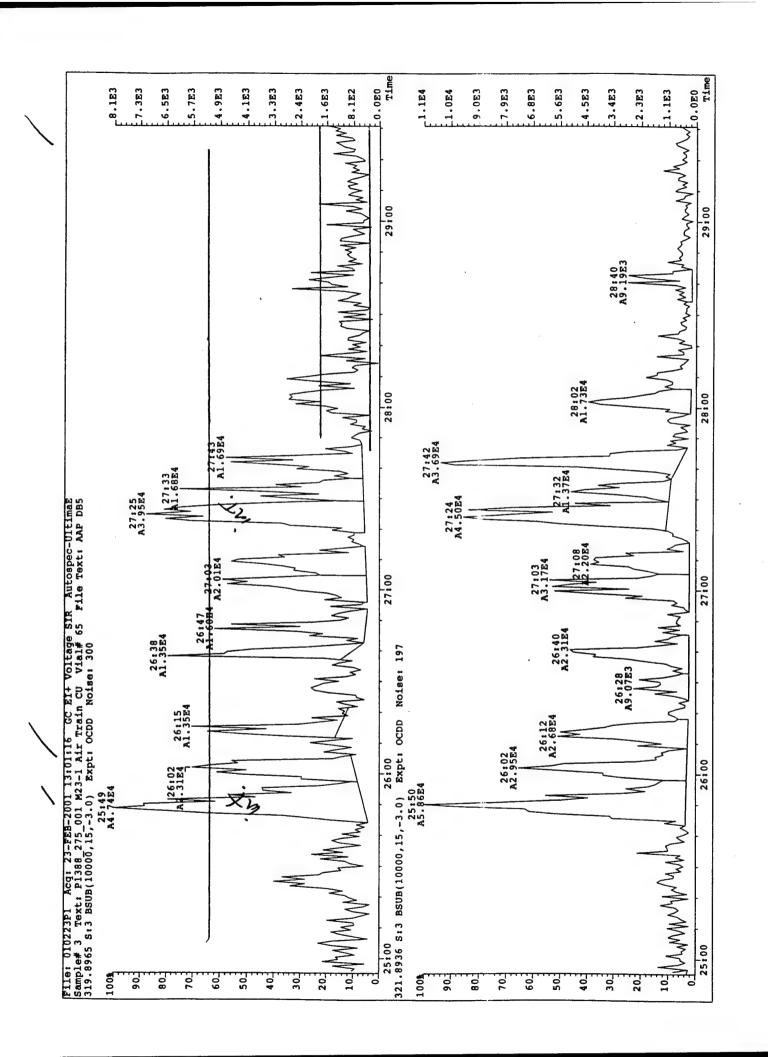
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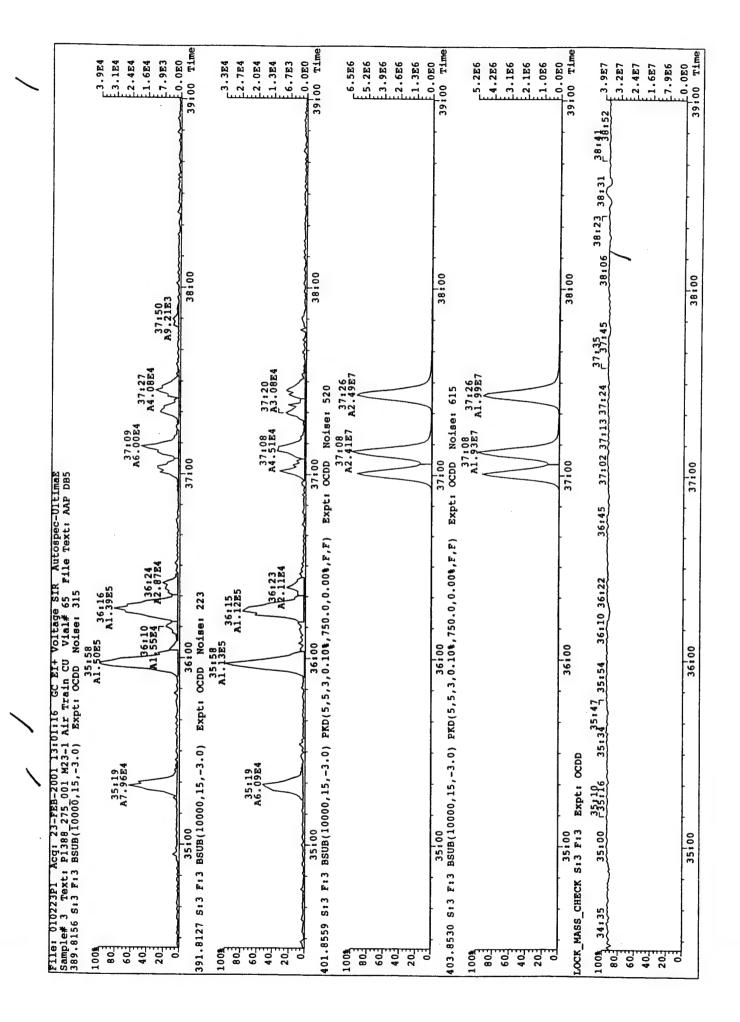
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36:29 / 1.290e+05 36:37 / 1.190e+05 36:51 / 9.000e+05 37:53 / 1.302e+05	tals cla le Name:	Acqui	otal Co	RT	39:48 1. 40:15 4.	42:15~1.
	n 1.086e+05 n 1.19 y 2.376e+05 2.376e+05 2.30e+01 n 8.713e+04 n 1.37 y 2.061e+05 2.061e+05 1.85e+01 n 7.522e+05 n 1.20 y 7.652e+06 1.652e+06 1.67e+02 n 9.724e+04 n 1.34 y 2.274e+05 2.274e+05 1.60e+01	n 1.086e+05 n 1.19 y 2.376e+05 2.30e+01 y 12.8 n 8.713e+04 n 1.37 y 2.061e+05 2.061e+05 1.85e+01 y 11.1 n 7.522e+05 n 1.20 y 2.52e+06 1.652e+06 1.67e+02 y 87.3 2,3,4,6,7,8-HxCDF n 9.724e+04 n 1.34 y 2.274e+05 2.274e+05 1.60e+01 y 13.7 1,2,3,7,8,9-HxCDF code EMPC Function: 4 Run #: 16 Sample #: 3 Sample text: P1388_275_001 M23-1 Air Train CU	n 1.086e+05 n 1.19 y 2.376e+05 2.30e+01 y 12.8 n 8.713e+04 n 1.37 y 2.061e+05 2.061e+05 1.85e+01 y 11.1 n 7.522e+05 n 1.20 y 2.652e+06 1.652e+06 1.67e+02 y 87.3 2,3,4,6,7,8-HxCDF n 9.724e+04 n 1.34 y 2.274e+05 2.274e+05 1.60e+01 y 13.7 1,2,3,7,8,9-HxCDF CDF EMPC Function: 4 Run #: 16 3921 Sample #: 3 Sample text: P1388_275_001 M23-1 Air Train CU FEEB-01 13:01:16 Processed: 23-FEB-01 14:56:00	n 1.086e+05 n 1.19 y 2.376e+05 2.30e+01 y 12.8 n 8.713e+04 n 1.37 y 2.061e+05 2.061e+05 1.85e+01 y 11.1 n 7.522e+05 n 1.20 y 7.652e+06 1.652e+06 1.67e+02 y 87.3 2,3,4,6,7,8-HxCDF n 9.724e+04 n 1.34 y 2.274e+05 2.274e+05 1.60e+01 y 13.7 1,2,3,7,8,9-HxCDF CDF EMPC CDF EMPC Function: 4 Run #: 16 :3P1 Sample #: 3 Sample text: P1388_275_001 M23-1 Air Train CU :FEB-01 13:01:16 Processed: 23-FEB-01 14:56:00	n 1.086e+05 n 1.19 y 2.376e+05 2.30e+01 y 12.8 n 8.713e+04 n 1.37 y 2.061e+05 2.061e+05 1.85e+01 y 11.1 n 7.522e+05 n 1.20 y 2.652e+06 1.652e+06 1.67e+02 y 87.3 2,3,4,6,7,8-HxCDF n 9.724e+04 n 1.34 y 2.274e+05 2.274e+05 1.60e+01 y 13.7 1,2,3,7,8,9-HxCDF cDF EMPC Function: 4 Run #: 16 :9.68 Unnamed Conc.: 109.495 mod. m2 Resp mod. RA Resp Adj_Resp S/N Conc. Name	n 1.086e+05 n 1.19 y 2.376e+05 2.30e+01 y 12.8 n 8.713e+04 n 1.37 y 2.061e+05 2.061e+05 1.85e+01 y 11.1 n 7.522e+05 n 1.20 y 2.652e+06 1.652e+06 1.67e+02 y 87.3 2,3,4,6,7,8-HxCDF n 9.724e+04 n 1.34 y 2.274e+05 2.274e+05 1.60e+01 y 13.7 1,2,3,7,8,9-HxCDF cDF EMPC Sample #: 3 Sample text: P1388_275_001 M23-1 Air Train CU 1-FEB-01 13:01:16 Processed: 23-FEB-01 14:56:00 9.68 Unnamed Conc.: 109.495 mod. m2 Resp mod. RA Resp Adj_Resp S/N Conc. Name n 1.948e+06 n 1.01 y 3.911e+06 3.57e+02 y 60.1 n 4.686e+05 n 0.98 y 9.263e+05 7.27e+01 y 49.4 n 3.693e+05 n 1.06 y 2.620e+05 7.24e+01 y 49.4

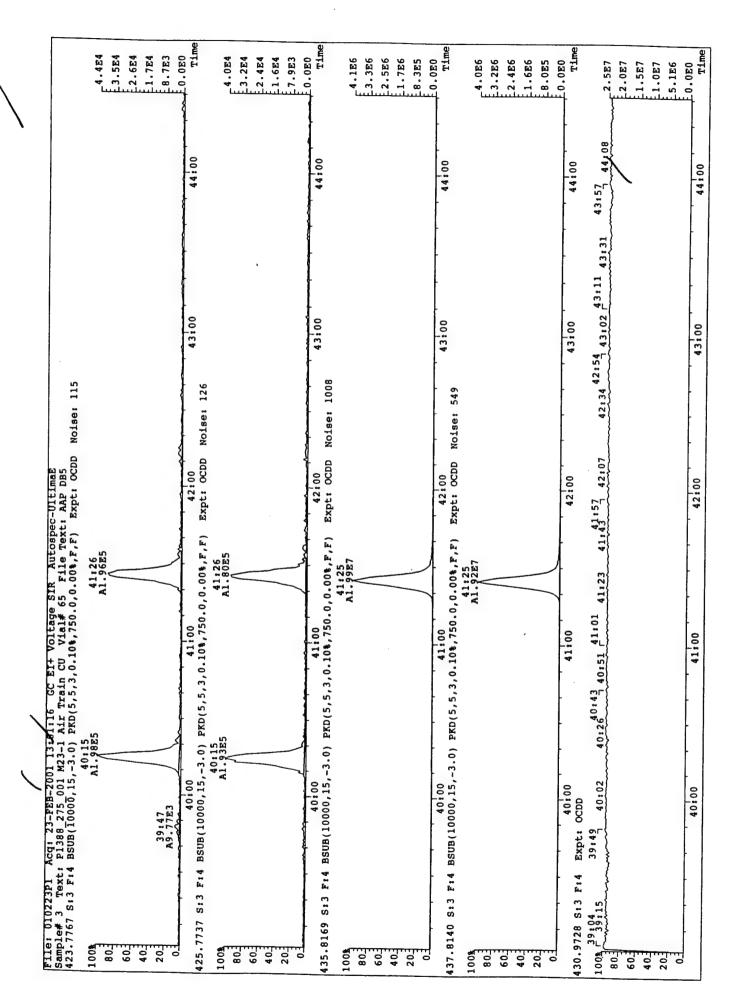


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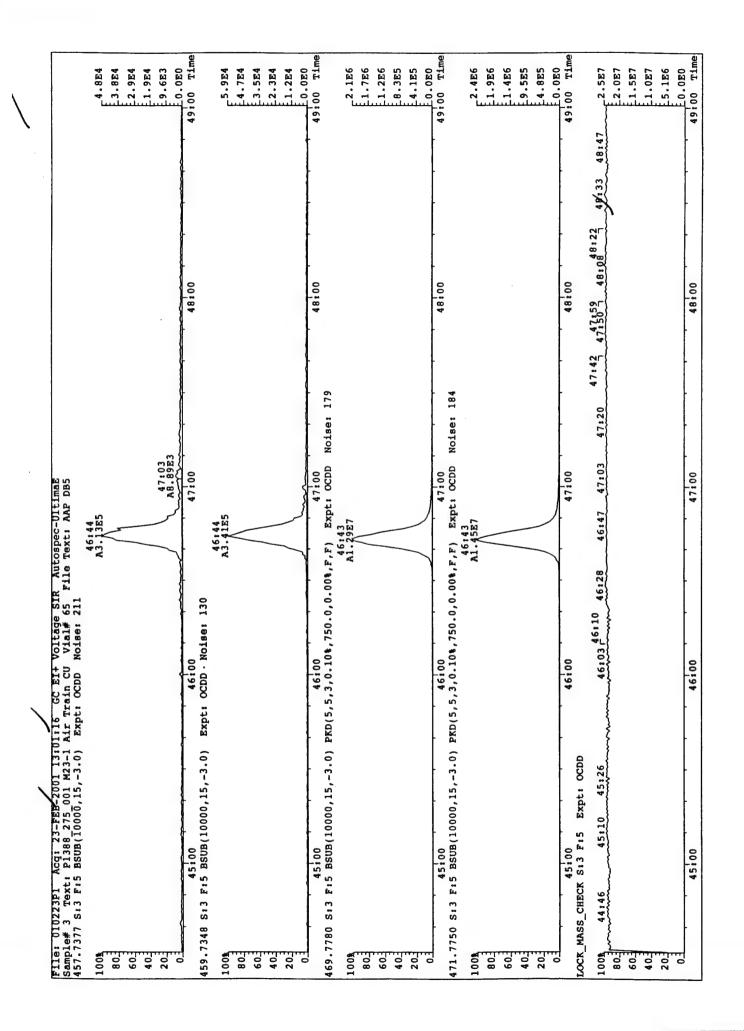
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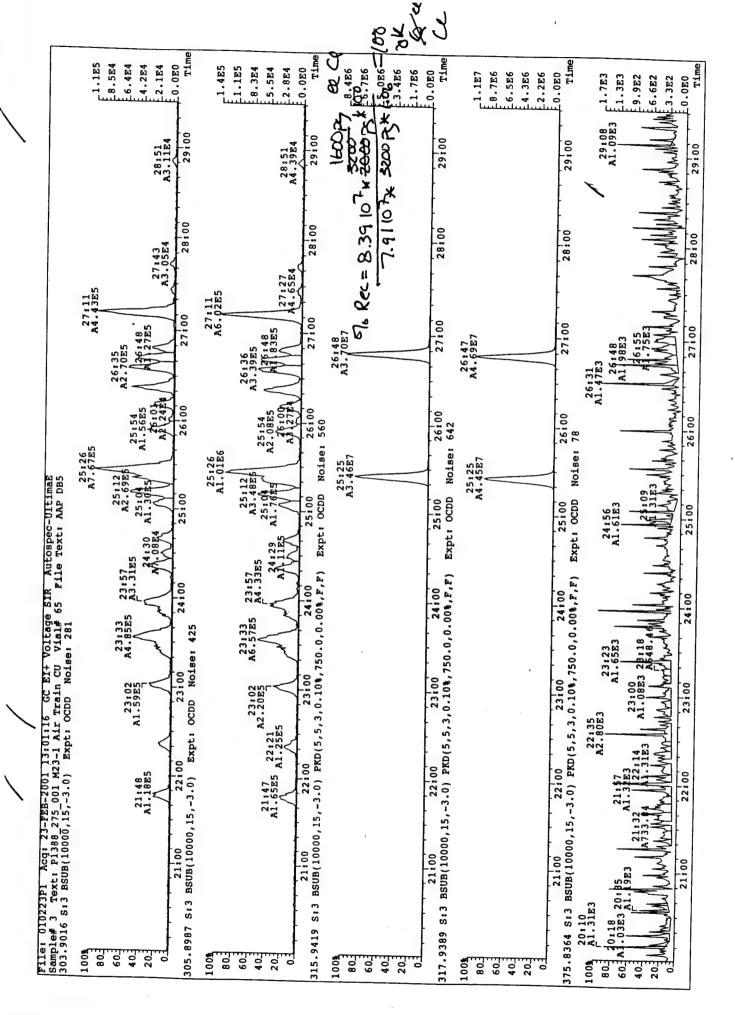


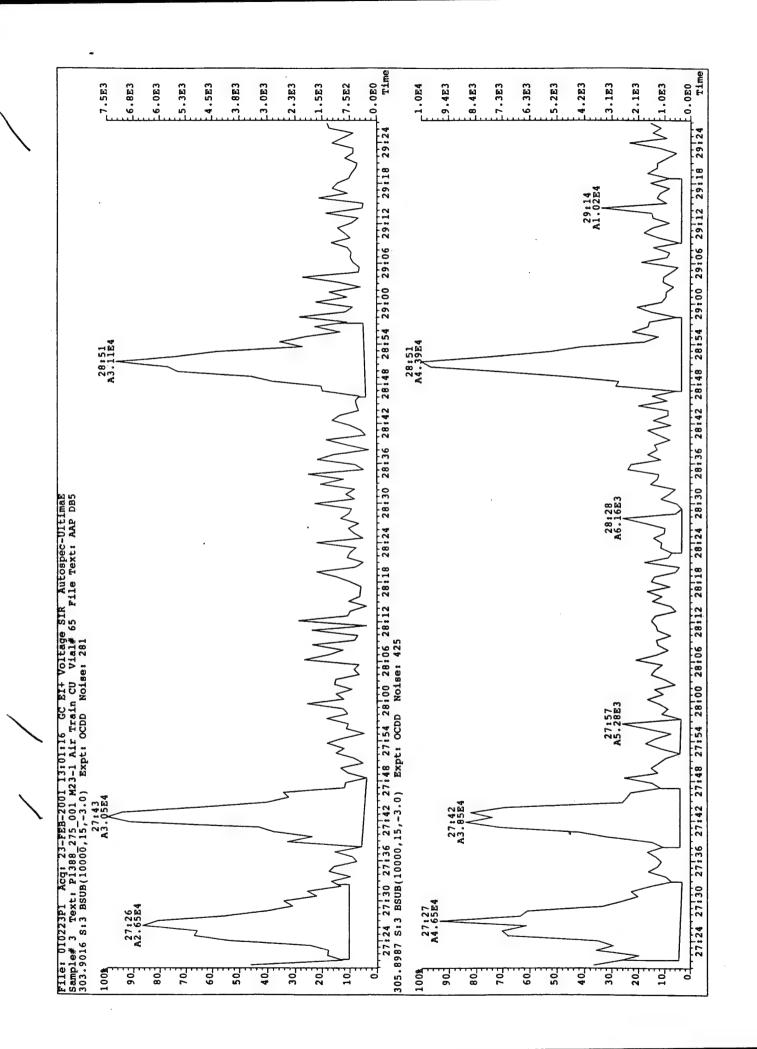




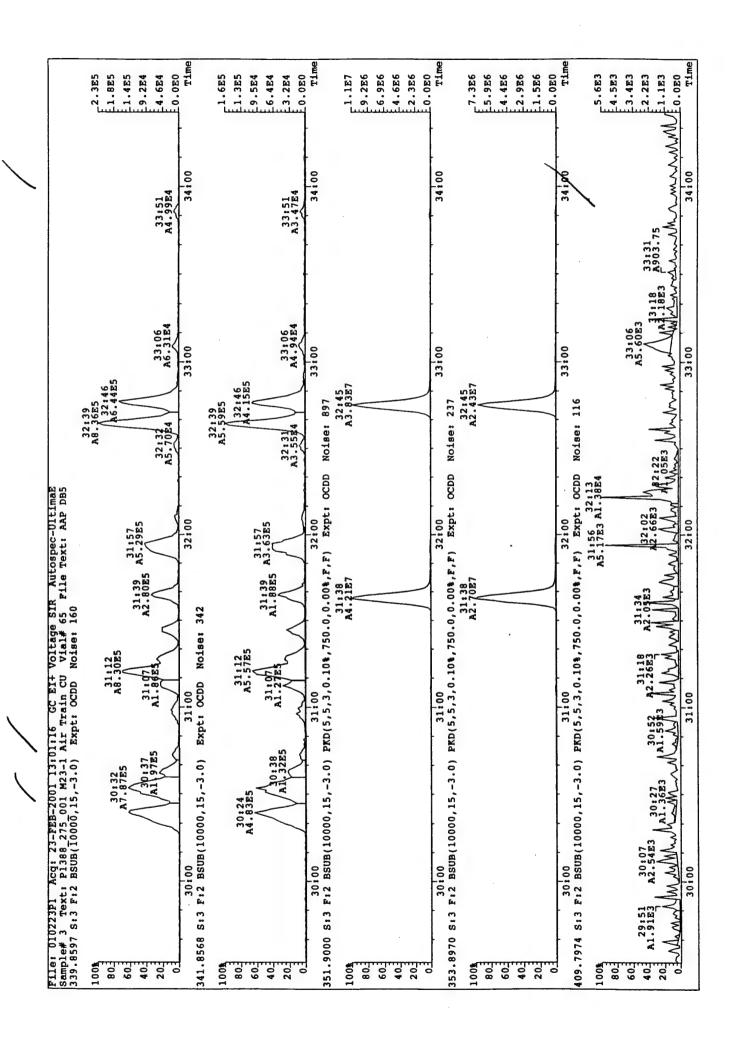
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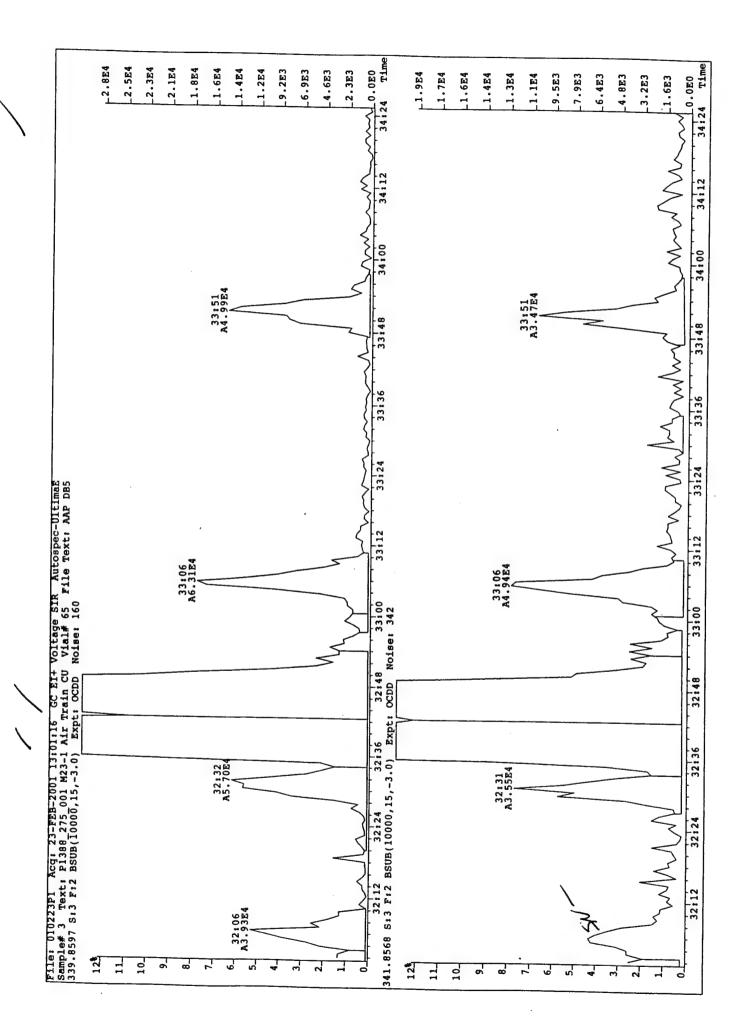






	28;50 A6.56E5 1.4E5	1.2ES 1.0ES 8.7E4	7.2E4 E5.8E4	4.3E4 2.9E4 1.4E4	26:00 27:00 28:00 29:00 29:00	28:49 A4.00E5 B.4E4 E7.5E4 E6.7E4 E5.9E4	2.564 2.254 2.554 2.554 2.554 8.483	26:00 27:00 28:00 28:00 29:00	25:09 25:29 26:11 26:37 27:20 27:41 28:23 29:04 1.4E7 1.3E7 1.1E7 1.1E7 1.1E7 1.1E7 1.1E7 1.1E7 1.1E7 1.1E6	26:00 27:00 28:00 29:00 Time
File: 010223Pl Acq: 23-FEB-2001 13:01:16 GC EI+ Voltage SIR Autospec-UltimaE Sample# 3 Text: P1388 275 001 M23-1 Air Train CU Vial# 65 File Text: AAP DB5 339.8597 S:3 BSUB(10000,15,-3.0) PRD(5,5,3.0,10* 750.0,000 FF.		70 <u>-</u> 60 <u>-</u> 50 <u>-</u>	30	10 0	341.8568 S:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,750.0,0.00%,F.F) Expt: OCDD	1008 901 801 701 601	20	0344 4 5:3 Expt: OCDD 22:00 23:00 24:00 25:00 25:00	100% 20,06 70 80 80 80 80 80 80 80 80 80 80 80 80 80	21:00 22:00 23:00 24:00 25:00





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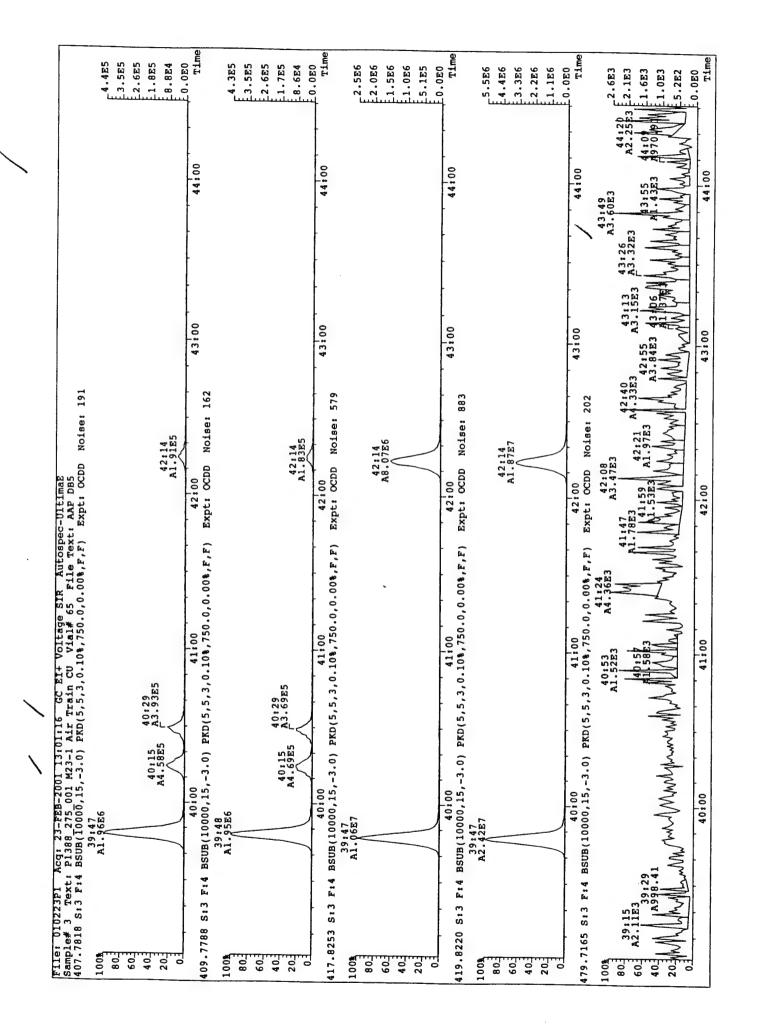
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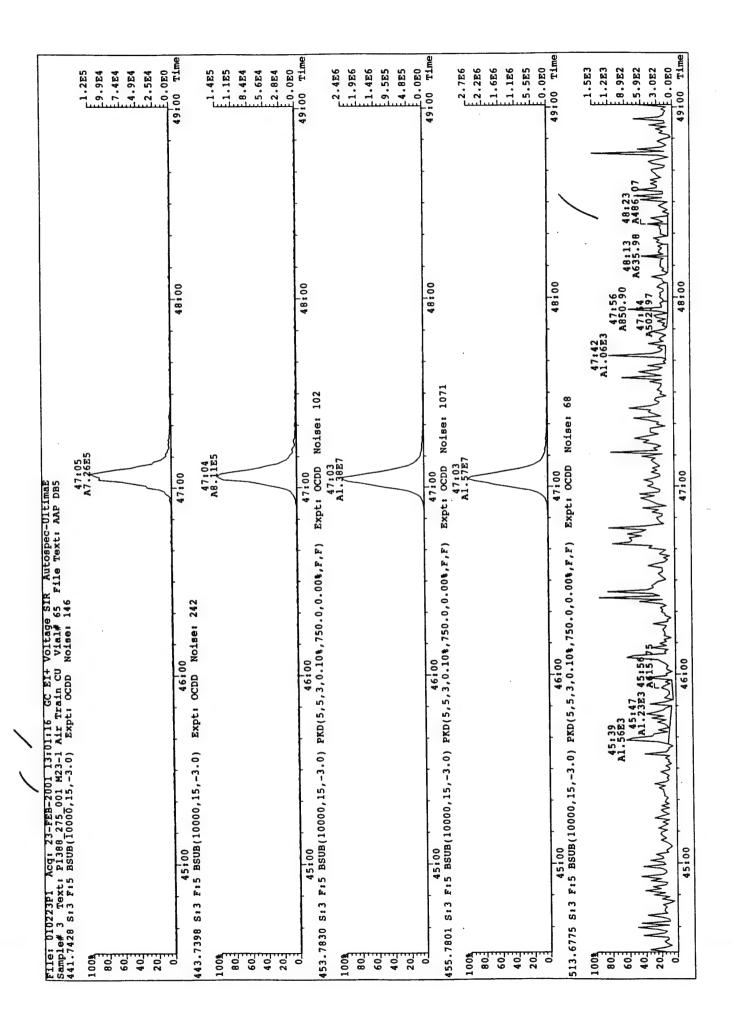
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	3.7E5 3.0E5 2.2E5 1.5E5	39:00 Time	1.9ES 1.3ES 6.4E4	39:00 Time	5.1E6 4.1E6 3.0E6 2.0E6	39:00 Time	9.786 7.786 5.886 3.986	39:00 Time	38:47 A1:10E3 5.0E2
	37:54 A1.30E5	38:00	37:52 A9.72E4	38:00	37:50 A1.60E7	38:00	37:50 A3.08E7	38100	A2.24F3 A1.59E3 A2.24F3 A1.59E3 A A2.24F3 AMA A1.22E3
<pre>* Autospec-UltimaE File Text: AAP DB5 00%,F,F) Expt: OCDD Noise: 355</pre>	36:50 A9.00E5	37:00 Expt: OCDD Noise: 259	36:51 A7.52E5	37:00 Expt: OCDD Noise: 2124		37100 Expt: OCDD Noise: 1526		37:00 Expt: OCDD Noise: 104 A7:68E3	15.6
GC EI+ Voltage SIR Frain CU Vial# 65 5,5,3,0.10%,750.0,0.	35:56 36:11 A6.40E5 A6.10E5 A A 109E5 36:29	36:00 5,5,3,0.10%,750.0,0.00%,E,F)	35:56 36:11 A5.01E5 A4.89E5 AB 86E4 36:29 AB 86E4 A1.09E5	36:00 5,5,3,0.10%,750.0,0.00%,F,F) 36:02 36:10 81.55E7 81.79E7		35:00 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,750.0,0.00%,F,F)		36:00 -3.0) PKD(5,5,3,0.10%,750.0,0.00%,F,F)	35:49 Many Many MAMANNAM
cq: 23-FEB-2001 13: P1388 275 001 M23-1 BSUB(10000,15,-3.0)	35:05 35:17 35:31 A.20E5 Al.75E5 A8.72E4	35:00 3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,7 4:52 .98E6	A1.01E5 35:18 35:31 A1.01E5 A1.39E5 A6.71E4	35:00 3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,7		35:00 3 BSUB(10000,15,-3.0) PKD(5		35:00 BSUB(10000,15,	84:57 B55.54 Mmn/mn/mn/m/m/m/m/m/m/m/m/m/m/m/m/m/m/m/
: 010223 1e# 3 T 8207 S:3	100% A1.40 60 34:40 40 A5.16E5	375.8178 S:3 F:3	805 605 405 405 A4.30E5 205 0		2 4 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	385.8610 St3 Ft3	8 8 4 8 0 0 0 0 0	445.7555 S:3 F:3	40 20 20 0





Sample ID:	M23-2					MoM	Mothod Mos
Client Data		Sample Data		I shoretony Date		DIAI.	מווסמ ואובט
Name: Project ID:	PES F181.001	Matrix: Weight/Volume:	Air +	Project No.:	P1388	Date Received:	6-Feb-01
Date Collected:	31-Jan-01		-	QC Batch No.:	P1388_275_002 275	Date Extracted: Date Analyzed:	8-Feb-01
Analyte	Conc.	٥٢	EMPC	Qualifier		Recoveries	
	pg	bd	bg		SI	SS	AS
2,3,7,8-TCDD	0.945			AB	86	102	96.2
1,2,3,7,8-PeCDD	2.44	:		<	108	105	2.00
1,2,3,4,7,8-HXCDD	EMPC		1.96	A	97.4	102	200
1,2,3,7,8,9-HxCDD	2.76 2.76		5.04	∢ •	97.4	102	86.2
1,2,3,4,6,7,8-HpCDD	21.5			∢ ₹	97.4	102	86.2
осрр	57.1			A A B	98.1	104	86.2
2.3.7 R.TCDE	1))) ()) ())	2	5	86.2
1,2,3,7,8-PeCDF	15.0			Ą	94	102	86.2
2,3,4,7,8-PeCDF	36.1			→	95.4	105	86.2
1,2,3,4,7,8-HxCDF				A	95.4	105	86.2
1,2,3,6,7,8-HxCDF	45.7			AB	85.9	104	86.2
2,3,4,6,7,8-HxCDF	73.7				85.9	104	86.2
1,2,3,7,8,9-HxCDF					82.9	104	86.2
1,2,3,4,6,7,8-HpCDF	208			ζ α	85.9	104	86.2
1,2,3,4,7,8,9-HpCDF				A	85.4	40.0	86.2
Totals a Tros	118				88.9	101	86.2 86.2
lotals & leds							1
TCDDs	. Ç						
PecDDs	31.3		15.6		WELV A	ANALYTICAL PER	PERSPECTIVES
HxCDDs	42.9		49.9		.40		
HpCDDs	44.4				72	zz 14 Exchange Urive Wilmington	
					S.	North Carolina 28405	
Pecors	265					USA	
HxCDFs	441		ဂဇ္ဇာ	3.1 3.1 3.1	1		
HpCDFs	328				<u>- 1</u>	Tel: 910 794-1613	
Total PCDD/Fs	1690		1710		e-mai	Fax: 910 794-3919 e-mail: vtondeur@cs.com	E
TEO (ND=0)	61.9		42.6	TEF	web:	web: www.ultratrace.com	
	P		42.6	TEF STATE			

Reviewer CL Date ZS RbØ1

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	Page 5 of	er: 7	202		108 1.3 1.
	010214P1- 010214P1-	Reviewer: C	Date	EMPC 15.6 33.9 49.9 44.4 265 37.3 360 441 380 98.0	108 — 97.4 — 98.1 — 98.1 — 98.1 — 98.3 — 95.4 — 95.4 — 98.9 — 98.9 — 98.9 — 98.9 — 98.9 — 98.9 — 98.2 — 104.1
	ConCal; EndCal;	0.408 0.925 1.92 2.14 1.91 2.46	0.22.11.1.1.1.0.0.0.0.0.0.0.0.0.0.0.0.0.	0.000 000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.	
		noise Fac 461 2.5 589 2.5 1208 2.5 1208 2.5 1208 2.5 1157 2.5	*****		
\	14:32:45 wt/vol: 1.000	if. CDE			
\	5 Acq: 14-FEB-01 ICal: MM1_M23_0*	Conc Qualif 0.903 2.44 1.96 5.04 2.76 21.5 57.1	8.77 15.2 36.1 46.0 45.7 73.7 11.1 208	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	4330 39900 39500 39650 39650 39650 39700 40000 40000 41150 39180
	S: 5 ICal	RT 27:44 33:11 37:06 37:13 37:32 41:31		2 3 3 5 2 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	33:11 44:12 44:12 26:50 26:50 31:49 33:12 47:03 37:49 37:49 37:49 37:05
	010214P1 ID: db-5	RRF 1.26 1.01 1.14 1.02 1.14 1.13	1.05 1.05 1.05 1.13 1.16 1.02 1.30	1.26 1.01 1.10 1.10 1.10 1.05 1.05 1.05	0.93 0.93 0.73 1.06 0.96 0.90 0.91 0.91
Page 1	Filename: 01 GC Column ID	524-10-11-15-15-15-15-15-15-15-15-15-15-15-15-	11.12.00 11.00 11.12.		75.11 75.01 75
	FI	Resp 1.91e+04 3.73e+04 2.77e+04 6.38e+04 3.90e+05 5.34e+05	1.86e+05 2.93e+05 2.93e+05 6.78e+05 8.49e+05 1.29e+06 1.69e+05 3.37e+06	2.55e+05 4.79e+05 5.87e+05 6.07e+05 5.62e+06 7.27e+05 6.17e+06 5.12e+06	6.05e+07 4.95e+07 3.65e+07 8.12e+07 7.45e+07 6.00e+07 3.93e+07 8.14e+07 5.45e+07 7.61e+07 7.61e+07 7.51e+07 7.51e+07 7.51e+07 7.51e+07
uan 24-FEB-2001 13:22	Client ID: M23-2 Lab ID: P1388_275_002	Name 2,3,7,8-TCDD 1,2,3,7,8-PeCDD 1,2,3,4,7,8-HxCDD 1,2,3,6,7,8-HxCDD 1,2,3,7,8,9-HxCDD 1,2,3,4,6,7,8-HpCDD 0,2,3,4,6,7,8-HpCDD 0,00DD	2,3,7,8-TCDF 1,2,3,7,8-PeCDF 2,3,4,7,8-PeCDF 1,2,3,4,7,8-HXCDF 1,2,3,4,6,7,8-HXCDF 1,2,3,4,6,7,8-HXCDF 1,2,3,4,6,7,8-HXCDF 1,2,3,4,6,7,8-HXCDF 1,2,3,4,6,7,8-HXCDF 1,2,3,4,6,7,8-PECDF	•	13C-1,2,3,7,8-PeCDD 13C-1,2,3,6,7,8-HxCDD 13C-1,2,3,6,7,8-HxCDD 13C-1,2,3,7,8-PeCDF 13C-1,2,3,7,8-PeCDF 13C-1,2,3,6,7,8-HxCDF 13C-1,2,3,4,6,7,8-HxCDF 13C-1,2,3,4,6,7,8-HxCDF 13C-1,2,3,4,6,7,8-HxCDD 13C-1,2,3,4,7,8-HxCDD 13C-1,2,3,7,8,9-HxCDD 13C-1,2,3,4,7,8-HxCDD 13C-1,2,3,4,7,8-HxCDD 13C-1,2,3,4,7,8-HxCDD 13C-1,2,3,4,7,8-HxCDD 13C-1,2,3,4,7,8-HxCDD 13C-1,2,3,4,7,8-HxCDD 13C-1,2,3,4,7,8-HxCDD 13C-1,2,3,4,7,8-HxCDD 13C-1,2,3,4,7,8-HxCDD 13C-1,2,3,4,7,8-HxCDD
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               9
                       Page
                                                                                                                                                                                                                                                                0.903 2,3,7,8-TCDD
                                                                                                                                                   Conc. Name
                                                                                                                                                                                                                                                                                                                                                                                                                       Name
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Conc. Name
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                                                                                                                                                                                                                          1.68
1.15
2.22
                                                                                                                                                                                                  1.59
                                                                                                                                                                                                              2.91
                                                                                                                                                                                                                                                                                                                                                                                                                      Conc.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      6.51
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                3.00
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        2.44
                                            Function: 1 Run #: 12
Sample text: Pl388_275_002 M23-2 Air Train
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         3.55
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1.34
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 6.87
                                                                                                                                                                                                                                                                                                                          Sample text: P1388_275_002 M23-2 Air Train
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Sample text: P1388_275_002 M23-2 Air Train
                                                                                                                                                                                                  8.93e+00
                                                                                                                                                                                                                1.25e+01
                                                                                                                                                                                                                            1.09e+01
                                                                                                                                                                                                                                        8.11e+00
                                                                                                                                                                                                                                                                             7.31e+00
                                                                                                                                                                         1.51e+01
                                                                                                                                                                                       1.21e+01
                                                                                                                                                                                                                                                     1.21e+01
                                                                                                                                                                                                                                                                 1.80e+01
                                                                                                                                                                                                                                                                                                                                                                                                                                              1.65e+01
                                                                                                                                                                                                                                                                                                                                                                                                                                                          5.25e+00
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  8.29e+00
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  9.42e+00
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              9.42e+00
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        6.28e+00
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    5.25e+00
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                4.37e+00
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1.58e+01
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1.19e+01
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                7.63e+00
                                                                                   Processed: 20-FEB-01 12:06:58
                                                                                                                                                                                                                                                                                                                                                       Processed: 20-FEB-01 12:06:58
                                                                                                                                                                                                                                                                                                                  Function: 2 Run #: 12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Processed: 20-FEB-01 12:06:58
                                                                                                                                                  S/N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Function: 3 Run #: 12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      N/S
                                                                                                                                                                                  0.90 (m) 3.401e+04 3.170e+04 0.72 y-5.363e+04 6.164e+04 0.87 y-5.164e+04 6.164e+04 0.91 (m) 2.640e+04 2.447e+04 0.82 y-4.702e+04 4.702e+04 0.25 (m) 4.11e+04 1.915e+04 0.73 y-2.045e+04 2.045e+04
                                                                                                                                                 Adj_Resp
                                                                                                                                                                           5.681e+04
                                                                                                                                                                                                                                                                                                                                                                                                                    Adj_Resp
                                                                                                                                                                                                                                                                                                                                                                                                                                               1.286e+05
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Adj_Resp
                                                                                                                                                                                                                                                                                                                                                                                                                                                          2.672e+04
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       9.979e+04
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   3.007e+04
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             5.667e+04
                                                                                                             Unnamed Conc.: 14.692
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 4.588e+04
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          5.444e+04
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       3.733e+04
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    2.053e+04
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1.898e+04
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                9.374e+04
                                                                                                                                                                                                                                                                                                                                                                                 Unnamed Conc.: 31.445
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Unnamed Conc.: 40.154
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                8 ¥3.007e+04 3
9 ¥4.588e+04 4
5 ¥5.667e+04 5
5 ¥5.444e+04 5
4 ¥4.733e+04 3
1 10.2.255e+04 2
                                                                                                                                                 Resp
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                                                                                 Acquired: 14-FEB-01 14:32:45
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1.101e+04 y
3.768e+04 y
1.122e+04 y
1.773e+04 y
2.142e+04 y
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                                           Totals class: TCDD EMPC
File Name: 010214P1 S
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27:26 2.114e+04
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Page 10 of 18
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21.5 1,2,3,4,6,7,8-HpCDD
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                                                    1,2,3,6,7,8-HxCDD
                                                                       2.76 1,2,3,7,8,9-HxCDD
                                           1.96 1,2,3,4,7,8-HxCDD
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Sample text: P1388_275_002 M23-2 Air Train
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                                                                                                                   S/N
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                                                                                                                                          28:52 4.599e+05 n 2.671e+05 n 1.72 y 7.270e+05 7.270e+05
                                                                                                                  Resp Adj_Resp
                                                                                                                                                                                                                                                                                                       Adj_Resp
                                                                                                                                                                                                                                                                                                                                y&.540e+05 8.540e+05
                                                                                                                                                                                                                                                               Unnamed Conc.: 270.944
                                                                                                                                                                                                                                                                                                                                                  y 8.984e+05 8.984e+05
                                                                                                                                                                                                                                                                                                                                                                                       y/1.324e+05 1.324e+05
                                                                                                                                                                                                                                                                                                                                                               2.396e+05
                                                                                                                                                                                                                                                                                                                                                                              7.282e+04
                                                                                                                                                                                                                                                                                                                                                                                                       y1.576e+05 1.576e+05
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       yJ.094e+05 7.094e+05
                                                                                                                                                                                                                                                                                                                                                                                                                       9.137e+05
                                                                                                                                                                                                                                                                                                                                                                                                                                      1.871e+05
                                                                                                                                                                                                                                                                                                                                                                                                                                                    2.933e+05
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  5.627e+05
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1.048e+06
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Resp Adj_Resp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                4.822e+04
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             6.077e+04
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         6.225e+04
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    y 3.915e+04 3.915e+04
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1.23 y/7.104e+05 7.104e+05
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1.21 y/1.965e+06 1.965e+06
1.23 y 2.695e+05 1.695e+05
1.17 y/2.509e+05 2.509e+05
                                                                       Unnamed Conc.: 37.331
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Unnamed Conc.: 270.352
   Function: 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                1.28 m 5.229e+04 4
1.28 m 5.229e+04 4
1.20 m 6.766e+04 6
                                                                                                                                                                                                                                                                                                         Resp
                                                                                                                                                                                                                                                                                                                                                                            y/7.282e+04
                                                                                                                                                                                                                                                                                                                                                                                                                                                  y 2.933e+05
                                                                                                                                                                                                                                                                                                                                                               y 2.396e+05
                                                                                                                                                                                                                                                                                                                                                                                                                       .137e+05
                                                                                                                                                                                                                                                                                                                                                                                                                                    .871e+05
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            .048è+06
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      .225e+04
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           .54 Y
                                                                                                                ml Resp mod. m2 Resp mod. RA
                                                                                                                                                                                                                                                                                                                                                                                                          1.46
                                                                                                                                                                                                                                                                                                                                                                                            1.36
                                                                                                                                                                                                                                                                                                       RA
                                                                                                                                                                                                                                                                                                                                                                                                                                                    1.45
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1.39
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            m! Resp mod. m2 Resp mod. RA
               Sample #1 5
                                                                                                                                                                                                      Sample #: 5
                                                                                                                                                                                                                                                                                                      ml Resp mod. m2 Resp mod.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Sample #1 5
Totals class: 1st Fnc. PecDF EMPC
                                          Acquired: 14-FEB-01 14:32:45
                                                                                                                                                                                                                                  Acquired: 14-FEB-01 14:32:45
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Acquired: 14-FEB-01 14:32:45
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1.551e+04 y
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         =
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 c
                                                                                                                                                                                                                                                                                                                                  3.587e+05
                                                                                                                                                                                                                                                                                                                                                 3.622e+05
                                                                                                                                                                                                                                                                                                                                                                                           5.606e+04
                                                                                                                                                                                                                                                                                                                                                                                                          6.412e+04
                                                                                                                                                                                                                                                                                                                                                               9.719e+04
                                                                                                                                                                                                                                                                                                                                                                             3.028e+04
                                                                                                                                                                                                                                                                                                                                                                                                                                     .756e+04
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 .250e+05
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                2.298e+04
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     .600e+04
                                                                                                                                                                                                                                                                                                                                                                                                                       3.760e+05
                                                                                                                                                                                                                                                                                                                                                                                                                                                   .199e+05
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           .118e+05
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          .878e+05
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     3.188e+05
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             .073e+04
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  7.599e+04
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    8.895e+05
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1.158e+05
                                                                                                                                                                                     Totals class: PecDF EMPC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Totals class: HxCDF EMPC
           File Name: 010214P1
                                                                     Total Conc.: 37.331
                                                                                                                                                                                                                                                             Total Conc.: 322.27
                                                                                                                                                                                                    File Name: 010214P1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      File Name: 010214P1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Total Conc.: 440.85
                                                                                                                                                                                                                                                                                                                                                                                        31:02 7.632e+04 y
31:10 9.352e+04 y
31:17 5.377e+05 y
31:30 1.096e+05 n
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  34:44 3.916e+05 n
34:56 1.075e+06 n
35:10 9.354e+04 n
35:22 1.351e+05 n
                                                                                                                                                                                                                                                                                                                                                                                                                                                   ¤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                >>>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        32:50 4.216e+05 y
                                                                                                                                                                                                                                                                                                                                 30:26 4.9536+05
                                                                                                                                                                                                                                                                                                                                            30:35 5.362e+05
                                                                                                                                                                                                                                                                                                                                                             30:41~ 1.425e+05
                                                                                                                                                                                                                                                                                                                                                                            30:47-4.254e+04
                                                                                                                                                                                                                                                                                                                                                                                                                                                 31:43~1.734e+05
                                                                                                                                                                                                                                                                                                                                                                                                                                                                32:00 3.377e+05
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           32:10 2.931e+04
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     32:43 6.357e+05
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  33:56 2.364e+04
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          32:35 / 3.694e+04
                                                                                                                 R
                                                                                                                                                                                                                                                                                                      RT
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24-FEB-2001 13:22

JSguan

		1,2,3,4,7,8-HxCDF	45.7 1,2,3,6,7,8-HXCDF				2,3,4,6,7,8-HxCDF	11.1 1,2,3,7,8,9-HxCDF	Page 18 of 18					Conc. Name	208 1,2,3,4,6,7,8-HpCDF			22.4 1,2,3,4,1,8,9-HPCDF
	7.45	40.0	45.7	8.60	10.6	9.57	73.7	11.1			ir Train			Conc.	208	54.2	42.7	77.7
	> >	~ >	>	7	>	>	^	>			1-2 A				>	>	>	>
	9.47e+00	4.77e+01	6.45e+01	9.54e+00	1.29e+01	1.23e+01	8.62e+01	8.15e+00		# 12 ·	75_002 M23	106:58		S/N	3.76e+02	8.62e+01	6.70e+01	3.086+01
Page 4	1.35 y/1.271e+05 1.271e+05	1.20 y/6.783e+05 6.783e+05	1.20 y P.488e+05 8.488e+05	1.15 y 1.468e+05 1.468e+05	1.22 y 4.816e+05 1.816e+05	1.14 ¥ 1.634e+05 1.634e+05	1.21 y.A.287e+06 1.287e+06	1.27 y 1.695e+05 1.695e+05		Function: 4 Run #: 12	Sam	5 Processed: 20-FEB-01 12:06:58	Unnamed Conc.: 96.887	d. RA Resp Adj_Resp	1.01 y/3.375e+06 3.375e+06	0.96 y/8.081e+05 8.081e+05	1.08 y 6.367e+05 6.367e+05	1.15 y 3.029e+05 3.029e+05
OPUSquan 24-FEB-2001 13:22	35:35 7.291e+04 n 5.418e+04 n	36:07 3.707e+05 n 3.076e+05 n		36:25-7.853e+04 n 6.828e+04 n	36:34 9.969e+04 n 8.190e+04 n		36:55 7:060e+05 n 5.812e+05 n			Totals class: HoCDF EMPC	File Name: 010214P1 Sample #: 5	Acquired: 14-FEB-01 14:32:45	Total Conc.: 327.58	RT . ml Resp mod. m2 Resp mod. RA	39:53 1.698e+06 n 1.677e+06 n	•	40:34 3.310e+05 n 3.057e+05 n	42:20 1.617e+05 n 1.412e+05 n

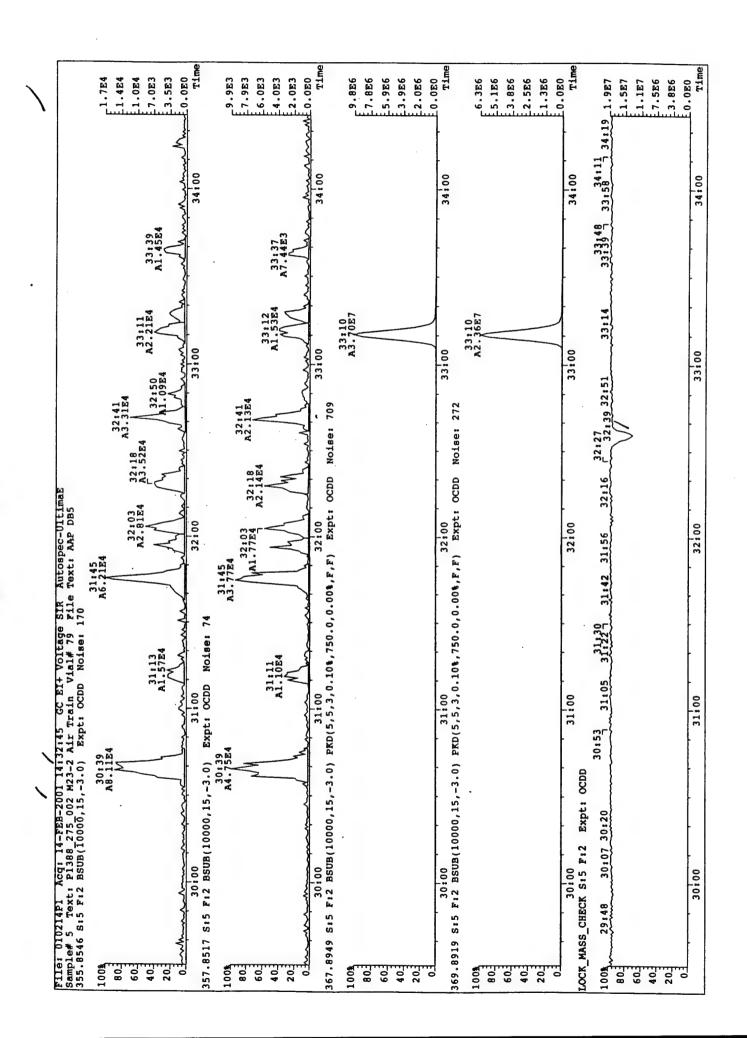
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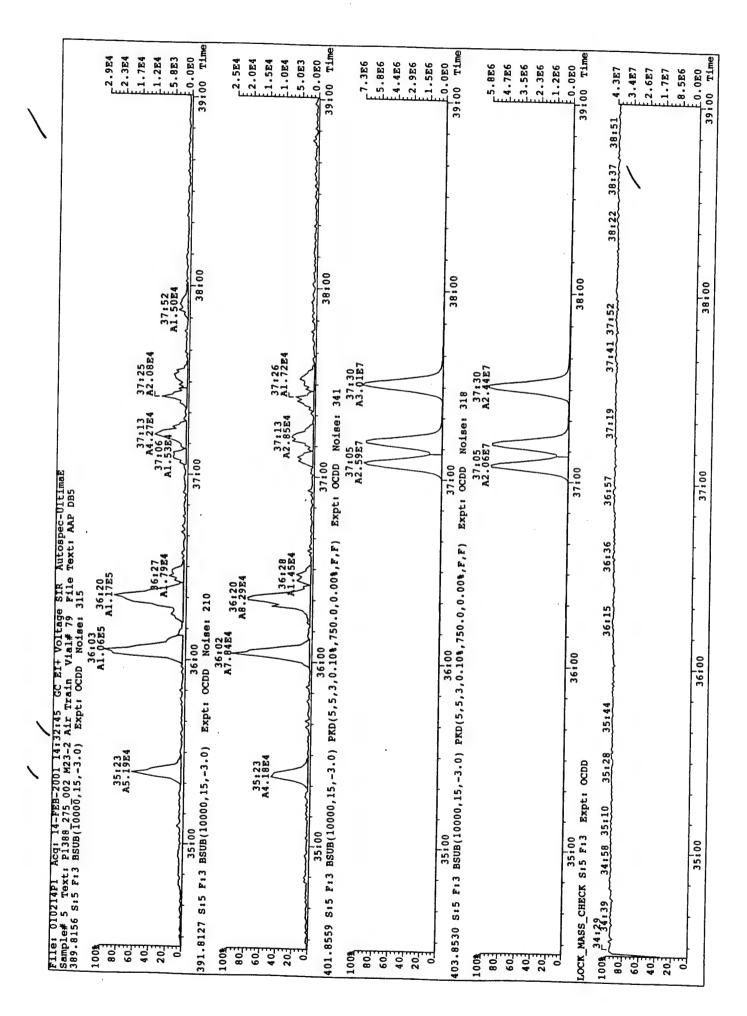
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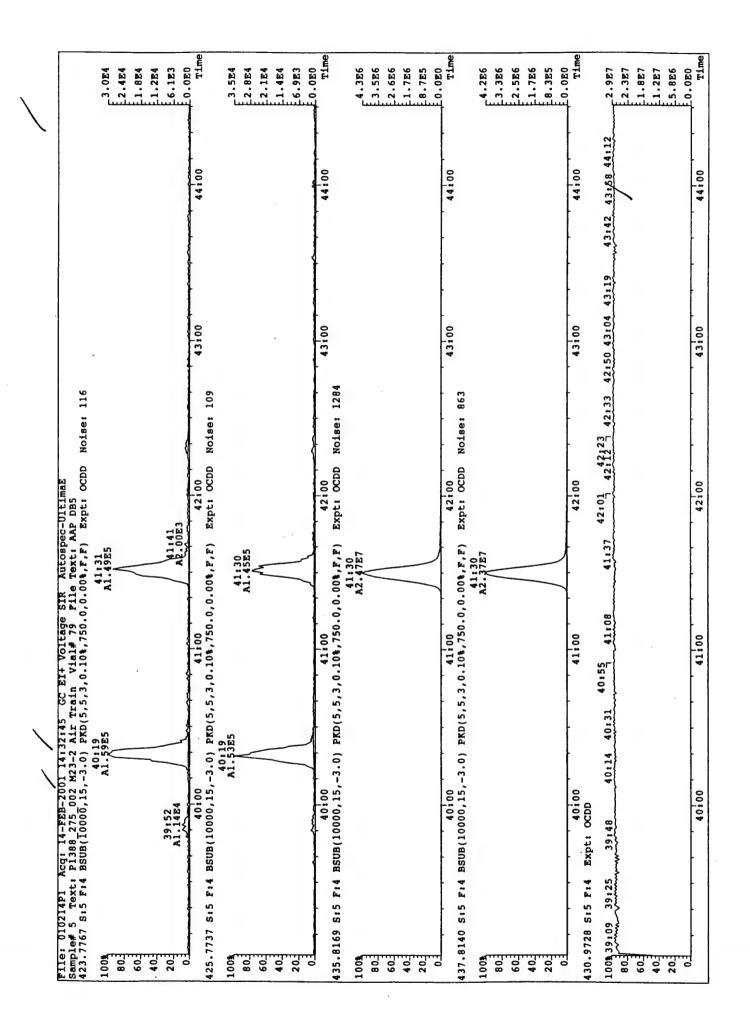




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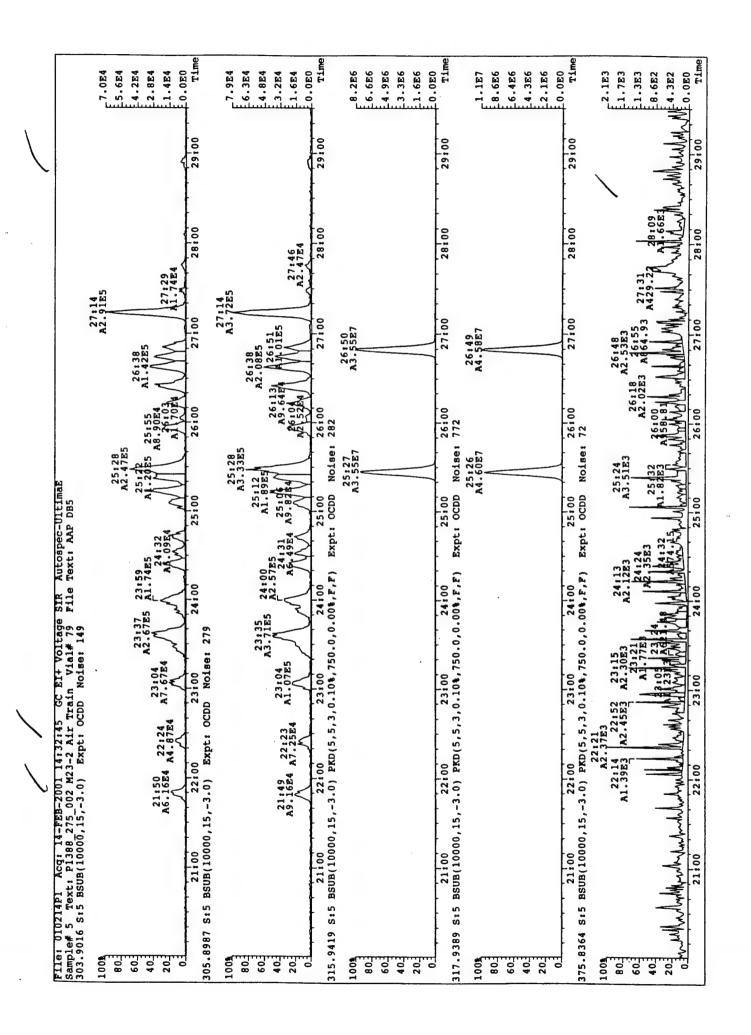
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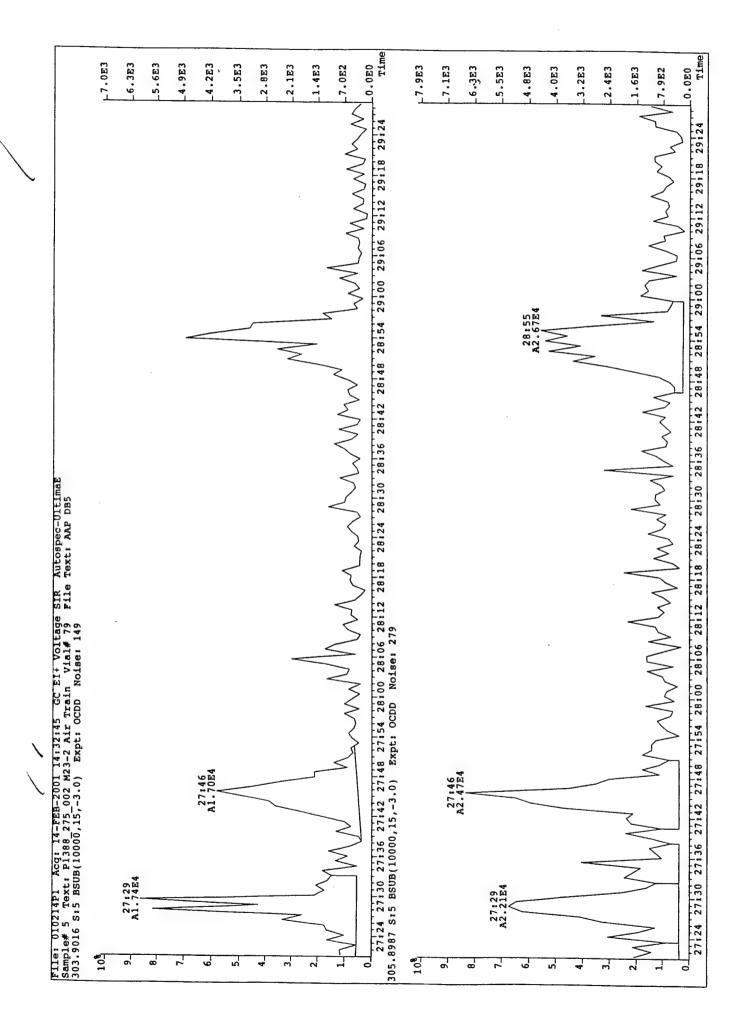


1 Acq: 14-reb-2001 14	age SIR	Autospec-UltimaE			
1388 275 002 M23- SUB(10000,15,-3.0	Sample# 5 Text: Pi388 275 002 M23-2 Air Train Vial# 79 File Text: AAP DB5 457.7377 S:5 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,750.0,0.00%,F,F) Expt: A6.51	AP DB5 Expt: OCDD Noise:	212		
	d	A2.50E5			3.5E4
		~			2.854
					E1.4E4
		47:12 A7.49E3			E7.0E3
45:00 5 BSUB(10000,15,-3.0	45:00 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,750.0,0.00%,F,F)	47:00 Expt: OCDD Noise:	122 48:00	7	49:00 Time
	~	46:52 A2.84E5			4.254
		_			3.454
					£2.5E4
	*	47:01 A4.68E3			8.4E3
45:00 45:00 F:5 BSUB(10000.153.0)	46:00 PKD(5.5.3.0.10%.750.0.00%.F.F)	47:00 Expt: OCDD Nofse:	48:00	*	49:00 Time
	A				2.256
					1.856
					1.3E6
		J			4.5E5
45:00 5 BSUB(10000,15,-3.0)	45:00 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,750.0,0.00%,F,F)	OCDD Noise:	48:00	4	49:00 Time
	A A1	46:50 A1.23E7			F2.6E6
					2.156
					1.056
					5.285
45:00 5 Expt: OCDD	46:00	47:00	48:00	4	49:00 Time
	45:37 45:50 46:03 46:14 46:24 46:40	46:58 47:09	47:34 47:46 47:58	48:19 48:38 48:517	2.857
				\	2.2E7
					E1.1E7
45:00	46:00	47:00	48:00	4	49:00 Time

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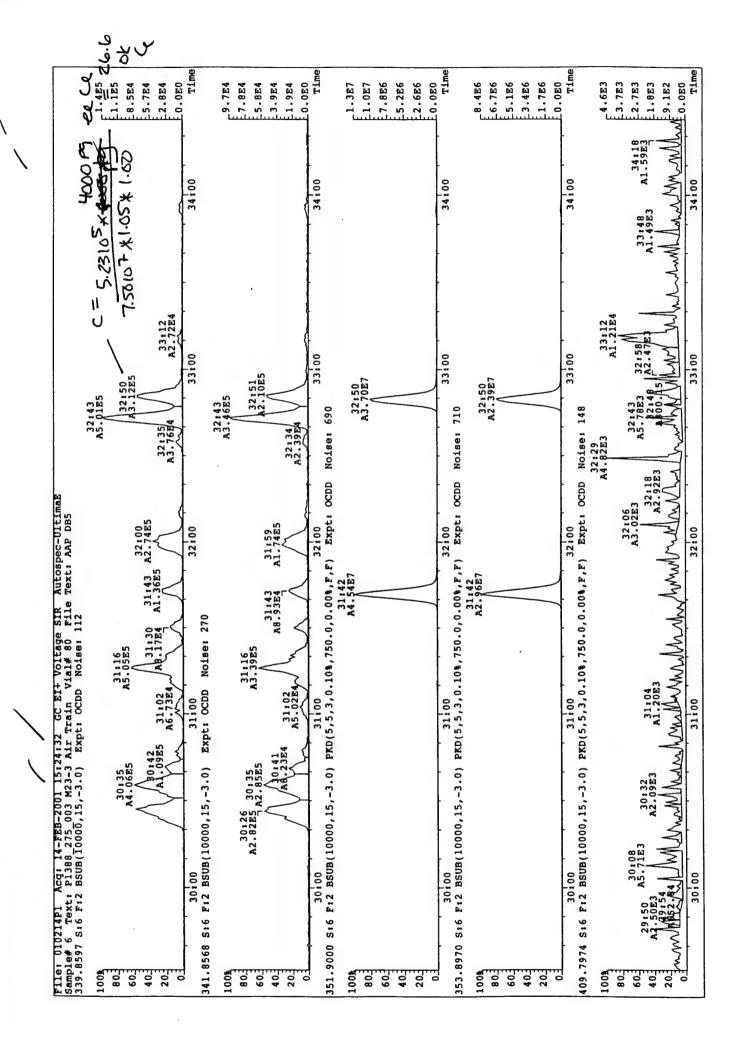




75.25

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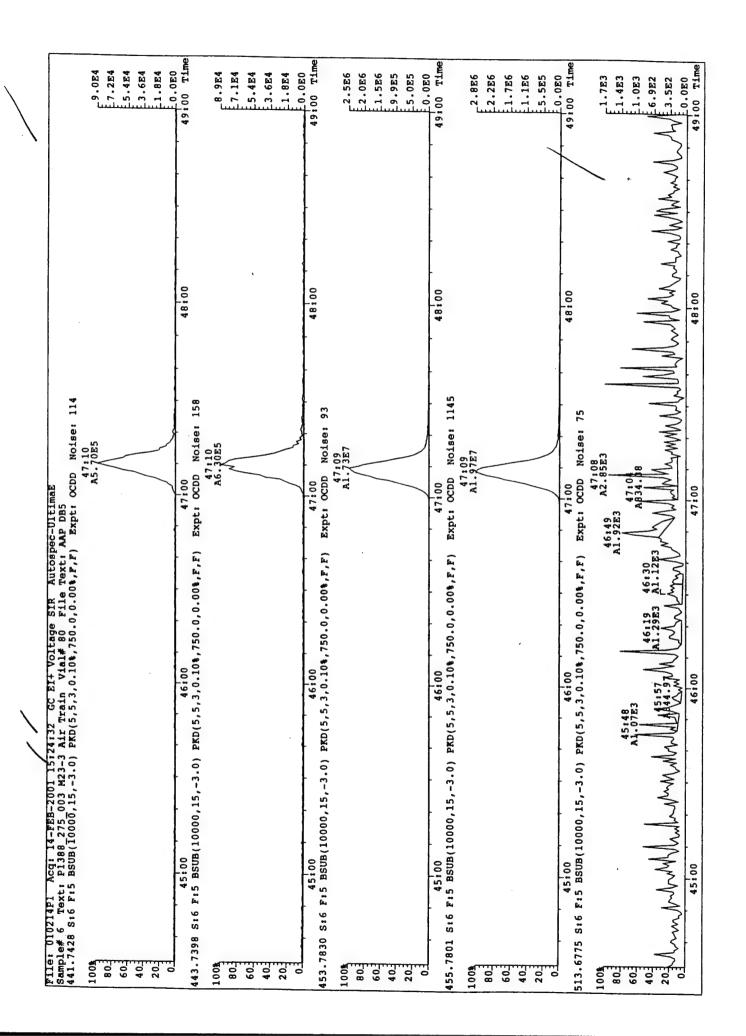
- 4



\		2.4E5 E1.9E5 E1.4E5	4.854	39:00 Time	F 2.0E5	1.255	4.004	39:00 Time	5.6E6	4.5E6	2.356	39:00 rime	E1.1E7	E8.9E6	4.426	19:00 Time		38:57 A4.28E3 38:36	A2.14E3 W 59.7E2	39:00 Time
			37:58 A7.05E4	38:00			37158 A6.32E4	38:00		37:54 A1.65E7		38:00		37:54 A3.20E7		38:00	3	38:24 A980.61	Ahman Mhumah	38:00
	SC EI+ Voltage SIR Autospec-UltimaE iin Vial# 80 File Text: AAP DB5 OCDD Noise: 239	36:00 36:15 36:56 A3.91E5 A3.61E5 A5.48E5	- 1	36:00 OCDD Noise: 224	36:55	36:00 A4.76E5 A3.15E5 36:16 A4.76E5	36:25 36:41 A4.76E4 A6.44E4	36:00 ,3,0.10%,750.0,0.00%,F,F) Expt: OCDD Noise: 1755	36:06 A1.98E7 A1.50E7			36:00	36:16 A3.87E7			36:00 37:00	orester by the state of the sta		whenhalment when I what I	36100
	File: 010214Pl Acq: 14-FEB-2001 15:24:32 GC EI Sample# 6 Text: P1388 275 003 M23-3 Air Train 373.8207 S:6 F:3 BSUB(10000,15,-3.0) Expt: OCDD 34:56	34:44 3096	AZ	35:00 8178 S:6 F:3 BSUB(10000,15,-3.0) Expt: 34:56	100% A6.67E5		203 A6.18E4 A8.40E4	35:00 383.8639 S:6 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,750	1008	77777 00 00 00 00 00 00 00 00 00 00 00 00 00	203	385.8610 S:6 F:3 BSUB(10000,15,-3.0) PKD(5,5,	100% 803		2001	35:00 445.7555 S:6 F:3 BSUR(10000.153.0) DED/5 5	#00 #00		MUNITALITY OBES A438 33	35i00

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ur Ex	2.2E5 1.7E5	1.1E5 5.6E4	Time	2.7E5	1.625 1.125 5.424	Time	2.5E6	.2.0E6	1.0E6 5.0E5	.o.ogo Time	5.7E6	.4.5E6 .3.4E6	2.356	0.000	Time	.2.4E3	1.2E3 6.0E2	0.050
·		<u> </u>	44:00	2 2 2	<u>ਜੋ ਜੇ ਲੰ</u>	44:00	F ² ,	1.1.	ਜ ਜ	44:00	الم	* m	2		44:00	A2.94E3 A3.07E3 E2.	8	44.00
			43:00			43:00				43:00					43:00	42:56 43: A2.33E3 43:0	MM 100 E 3 CE 3 CE 3 CE 3 CE 3 CE 3 CE 3 CE	42,00
Text: AAP DB5 (*,F,F) Expt: OCDD Noise: 145		42:20 A1.23E5	42:00 Expt: OCDD Noise: 93		42:20 A1.20E5	42:00 Expt: OCDD Noise: 643		42:19 A8.89E6		42:00 Expt: OCDD Noise: 827		42:19 A2.04E7			42:00 Expt: OCDD Noise: 238		14 158 42 1 12 MM MAL WALLEY W	
.0,0.00		io.	41:00 0.10%,750.0,0.00%,F,F)		51	41:00 0.10%,750.0,0.00%,F,F)				41:00 0.10%,750.0,0.00%,F,F)					41:00 0.10%,750.0,0.00%,F,F) 41:30	A41:37	My homen all his	
P1388 275 003 M23-3 Air Train Vial# 80 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,750 39:53 Al.33E6		40:21 A3.22E5 A2.71E5	41:00 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,750	1.33E6	40:19 40:34 A3.32E5 A2.54E5	40:00 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,750	33:52 A1.22E7			40:00 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,750	39:52 A2.78E7				41:00 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,750	3 40:09 40:21 3 A2.93E3 A4.45E3	39:513 42:7383 7.74 400 WWW.MARAM	
407.7818 S:6 F:4 BSUB(1 3		20000	.7788 S:6 F:4		20 00 00 00 00 00 00 00 00 00 00 00 00 0	.8253 St6 Ft4	w 777	603	20 40	8220 S:6 F:4		60	401	0	7165 S16 F14	803 39:43 603 A4 28E3	Mh. A. A. 195.38	



ALTA ANALYTICAL PERSPECTIVES

PART 4

SYSTEM PERFORMANCE

MS & GC CONCAL DOCUMENTATION FOR THE ANALYSIS

С П POLYCHLORINATED DIBENZO-PDIOXINS & DIBENZOFURANS

OPUSquan	OPUSquan 20-FEB-2001 12:07	Page 1
		Page 1 of 1

PCDD/PCDF CALIBRATION VERIFICATION

Alta Analytical Perspectives

Initial Calibration Date: 10/05/00	Reviewer:
nstrument ID: MM-1 GC Column ID: DB-5	Date: 1250
VER Data Filename: 010214Pl S#1 Analysis Date: 14-FEB-01 Time: 11:05:47	

VER Data Filename: 010214P1	: 010214P1	S#1 An	S#1 Analysis Date: 14-FEB-01 Time: 11:05:47	14-FEB-0	1 Time: 1	1:05:47	
NATIVE ANALYTES	M/Z'S FORMING RATIO	ION ABUND. RATIO	QC LIMITS	PASS	CONC. FOUND	CONC. RANGE (ng/mL)	
2,3,7,8-TCDD	M/M+2	0.77	0.65-0.89	۲	5.38	3.75 - 6.25	
1,2,3,7,8-PeCDD	M+2/M+4	1.57	1.32-1.78	γ	26.24	18.75-31.25	
1,2,3,4,7,8-HxCDD 1,2,3,6,7,8-HxCDD 1,2,3,7,8,9-HxCDD	M+2/M+4 M+2/M+4 M+2/M+4	1.25	1.05-1.43 1.05-1.43 1.05-1.43	* * *	25.21 ~ 25.49 ~ 24.67 /	18.75-31.25 18.75-31.25 18.75-31.25	
1,2,3,4,6,7,8-HpCDD M+2/M+4	M+2/M+4	1.03	0.88-1.20	>1	25.05/	18.75-31.25	
осър	M+2/M+4	0.88	0.76-1.02	٨	51.12	37 - 65	
2,3,7,8-TCDF	M/M+2	0.75	0.65-0.89	۲	4.54	3.75 - 6.25	
1,2,3,7,8-PeCDF 2,3,4,7,8-PeCDF	M+2/M+4 M+2/M+4	1.53	1.32-1.78	* *	23.76 / 23.32 /	18.75-31.25 18.75-31.25	
1,2,3,4,7,8-HxCDF	M+2/M+4	1.23	1.05-1.43	٨	24.39	18.75-31.25	
1,2,3,6,7,8-HxCDF 2,3,4,6,7,8-HxCDF	M+2/M+4 M+2/M+4	1.19	1.05-1.43	۸ >	24.08/	18.75-31.25	
1,2,3,7,8,9-HxCDF	M+2/M+4	1.25	1.05-1.43	۸ ،	24.51/	18.75-31.25	
1,2,3,4,6,7,8-HpCDF M+2/M+4 1,2,3,4,7,8,9-HpCDF M+2/M+4	M+2/M+4 M+2/M+4	1.02	0.88-1.20 0.88-1.20	A A	23.56 / 23.07/	18.75-31.25 18.75-31.25	
OCDF	M+2/M+4	0.89	0.76-1.02	*	47.99	35 - 65	

Analyst: 6AE
Date: 20 Feb 2/

öf Page 1 不ひめ Date: 30 Febol Analyst: 64G J Date: 24 Reviewer: 70.0 - 130.0 70.0 - 130.0 70.0 - 130.0 70.0 - 130.0 70.0 - 130.0 70.0 - 130.0 70.0 - 130.0 70.0 - 130.0 70.0 - 130.0 75.0 - 125.0 75.0 - 125.0 75.0 - 125.0 75.0 - 125.0 75.0 - 125.0 75.0 - 125.0 (ng/mF) RANGE S#1 Analysis Date: 14-FEB-01 Time: 11:05:47 101.3 1 100.7 1 104.1 1 93.7 / 99.6 / 97.7 / 92.1 / 93.3 / 92.9 / 94.5 82.8 83.3 87.3 86.8 FOUND PCDD/PCDF CALIBRATION VERIFICATION Alta Analytical Perspectives Pass >>>> > 1.05-1.43 0.43-0.59 0.37-0.51 0.65-0.89 1.05-1.43 0.65-0.89 0.37-0.51 0.76-1.02 0.43-0.59 0.43-0.59 QC LIMITS Page GC Column ID: DB-5 ABUND. RATIO 1.23 1.03 0.89 0.77 NOI 1.55 1.29 0.52 0.43 0.52 0.78 $\begin{array}{c} 1.54 \\ 0.52 \\ 0.44 \\ 0.89 \end{array}$ Initial Calibration Date: 10/05/00 M/M+2 M+2/M+4 M+2/M+4 M+2/M+4 M+2/M+4 M/M+2 M/M+2 M+2/M+4 M+2/M+4 M+2/M+4 M+2/M+4 VER Data Filename: 010214P1 M/Z'S FORMING RATIO M/M+2 M/M+2 M/M+2 M/M+2 20-FEB-2001 12:07 37C1-2,3,7,8-TCDD 13C-2,3,4,7,8-PeCDF M 13C-1,2,3,4,7,8-HxCDD H 13C-1,2,3,4,7,8-HxCDF M 13C-1,2,3,4,7,8,9-HpCDF M 13C-1,2,3,7,8-PeCDD 13C-1,2,3,6,7,8-HxCDD 13C-1,2,3,4,6,7,8-HpCDD 13C-1,2,3,7,8-PeCDF 13C-1,2,3,6,7,8-HxCDF 13C-1,2,3,4,6,7,8-HpCDF Instrument ID: MM-1 13C-1,2,3,7,8,9-HxCDF LABELED COMPOUNDS 13C-2,3,7,8-TCDD 13C-2,3,7,8-TCDF 13C-0CDD OPUSquan 13C-OCDF

### Contrainer October Part Par	P CPSM / M23 CS3 Name Res 2,3,7,8-TCDD 4,34e+0 2,3,7,8-ECDD 1.40e+0 3,4,7,8-EXCDD 1.27e+0 3,7,8,9-EXCDD 1.27e+0 CCDD 1.25e+0 CCDD 1.25e+0 CCDD 1.26e+0 2,3,7,8-ECDF 1.82e+0 1,4,7,8-ECDF 1.82e+0 1,4,7,8-EXCDF 1.69e+0 1,4,7,8-EXCDF 1.69e+0 1,6,7,8-EXCDF 1.69e+0 1,6,7,8-EXCDF 1.69e+0 1,6,7,8-EXCDF 1.60e+0 1,7,8,9-EXCDF 1.70e+0 1,	** ****	S	M23 0: WE/VOI:		010214F1 010214F1	7
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6.40e+07 0.78 y 1.13 27:43 93.7 5.54e+07 1.57 y 0.93 33:11 99.6 4.87e+07 1.23 y 0.93 37:12 97.7 4.46e+07 1.03 y 0.91 41:30 92.1 3.66e+07 0.89 y 0.73 46:50 92.9 7.42e+07 0.77 y 1.06 26:50 92.9 7.42e+07 0.77 y 1.06 26:50 92.9 7.42e+07 0.52 y 1.28 36:15 82.8 4.02e+07 0.44 y 0.90 39:52 83.3 3.78e+07 0.89 y 0.81 47:09 87.3 6.02e+07 0.77 y 1.00 27:03 100 8.20e+07 0.77 y 1.00 25:27 100 5.34e+07 1.23 y 1.00 25:27 100 5.34e+07 1.25 y 0.91 32:50 101 4.53e+07 1.29 y 0.92 37:05 101 4.53e+07 0.52 y 0.91 36:06 104 3.43e+07 0.52 y 0.91 36:06 104	2.67e+07	y 1.4	915	46.8	15 2.5 0.	9 47	
5.54e+07 1.57 y 0.93 33:11 99.6 4.87e+07 1.23 yy 0.93 37:12 97.7 4.46e+07 1.03 y 0.93 37:12 97.7 4.46e+07 1.03 y 0.91 41:30 92.1 3.66e+07 0.89 yy 0.73 46:50 92.9 7.42e+07 0.77 y 1.06 26:50 92.9 5.67e+07 0.52 y 1.28 36:15 82.8 4.02e+07 0.44 yy 0.90 39:52 83.3 3.78e+07 0.89 yy 0.81 47:09 87.3 6.02e+07 0.77 y 1.00 27:03 100 8.20e+07 0.77 y 1.00 25:27 100 5.34e+07 1.23 yy 1.00 37:31 100 5.34e+07 1.25 yy 0.91 32:50 101 4.53e+07 0.52 y 0.91 36:06 104 5.343e+07 0.52 y 0.91 36:06 104 5.343e+07 0.52 y 0.95 37:55 86.8	6.406+07	1.1	4			Rec 3 7 1	
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4.46e+07 1.03 y 0.91 41:30 92.1 3.66e+07 0.89 y 0.73 46:50 93.3 8.07e+07 0.77 y 1.06 26:50 92.9 7.42e+07 1.54 y 0.96 31:42 94.5 5.67e+07 0.52 y 1.28 36:15 82.8 4.02e+07 0.44 y 0.90 39:52 83.3 3.78e+07 0.89 y 0.81 47:09 87.3 6.02e+07 0.77 y 1.00 27:03 100 5.34e+07 1.23 y 1.00 25:27 100 5.34e+07 1.23 y 1.00 25:27 100 3.40e+07 0.52 y 0.91 36:06 101 4.53e+07 1.29 y 0.92 37:05 101 5.37e+07 0.52 y 0.91 36:06 104 3.43e+07 0.52 y 0.91 36:06 104 3.43e+07 0.52 y 0.91 36:06	4.87e+07		37:12	۱r		10000	
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4.02e+07 0.44 y/ 0.90 39:52 83.3 8 3.78e+07 0.89 y/ 0.81 47:09 87.3 8 6.02e+07 0.79 y/ 1.00 27:03 100 8.20e+07 0.77 y/ 1.00 25:27 100 5.34e+07 1.23 y/ 1.00 37:31 100 3.40e+07 0.51 27:45 101 4.53e+07 1.55 y/ 0.97 32:50 101 4.53e+07 0.52 y/ 0.92 37:05 101 5.37e+07 0.52 y/ 0.91 36:06 104 3.43e+07 0.52 y/ 0.95 42:20 99.9 4.96e+07 0.52 y/ 1.07 37:55 86.8	5.67e+07	,	Ξ	2		82.8	
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4.96e+07 0.52 v/1.07 37:55 86.8	3.43e+07	٠, ১	42:20	*OT 6			
	4.96e+07	: >	S	8 9			

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Page 7 of

FORM 5
PCDD/PCDF RT WINDOW AND ISOMER SPECIFICITY STANDARDS

Lab Name: Alta Analytical Perspectives Episode No.:

Contract No.

SAS No. 1

Instrument ID: MM-1

Initial Calibration Date: 10/5/00

RT Window Data Filename: 010214Pl S#1 Analysis Date: 14-FEB-01 Time: 11:05:47

DB-5 IS Data Filename: 010214Pl S#1 Analysis Date: 14-FEB-01 Time: 11:05:47

Time:

Analysis Date: DB_225 IS Data Filename:

Date: 24 Fcb & Reviewer

	ABSC	OLUTE		ABSOLUTE

	ABSOLUTE		ABSOLUTE
	RT	ISOMERS	RT
1,3,6,8-TCDD (F)	24:00	1,3,6,8-TCDF (F)	21:50
1,2,8,9-TCDD (L)	28:45	1,2,8,9-TCDF (L)	28:54
1,2,4,7,9-PeCDD (F)	30 139	1,3,4,6,8-PeCDF (F)	28:51
1,2,3,8,9-PeCDD (L)	33:39 /	1,2,3,8,9-PeCDF (L)	33:56
1,2,4,6,7,9-HXCDD (F)	35:24	1,2,3,4,6,8-HxCDF (F)	34 144 ~
1,2,3,7,8,9-HxCDD (L)	37:32	1,2,3,7,8,9-HxCDF (L)	37:56
1,2,3,4,6,7,9-HpCDD (F)	40:19	1,2,3,4,6,7,8-HpCDF (F)	39153
1,2,3,4,6,7,8-HpCDD (L)	41:31/	1,2,3,4,7,8,9-HpCDF (L)	42:20

(F) = First eluting isomer (DB-5); (L) = Last eluting isomer (DB-5).

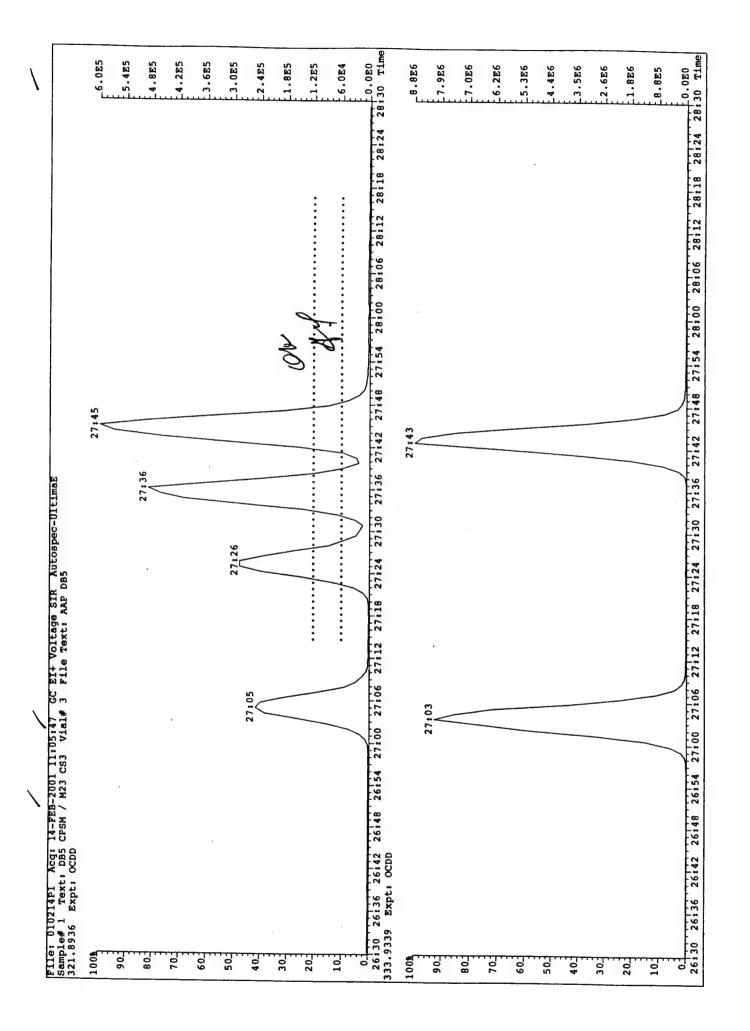
ISOMER SPECIFICITY (IS) TEST STANDARD RESULTS

COMPARED PEAKS (1) & VALLEY HEIGHT BETWEEN

<25%

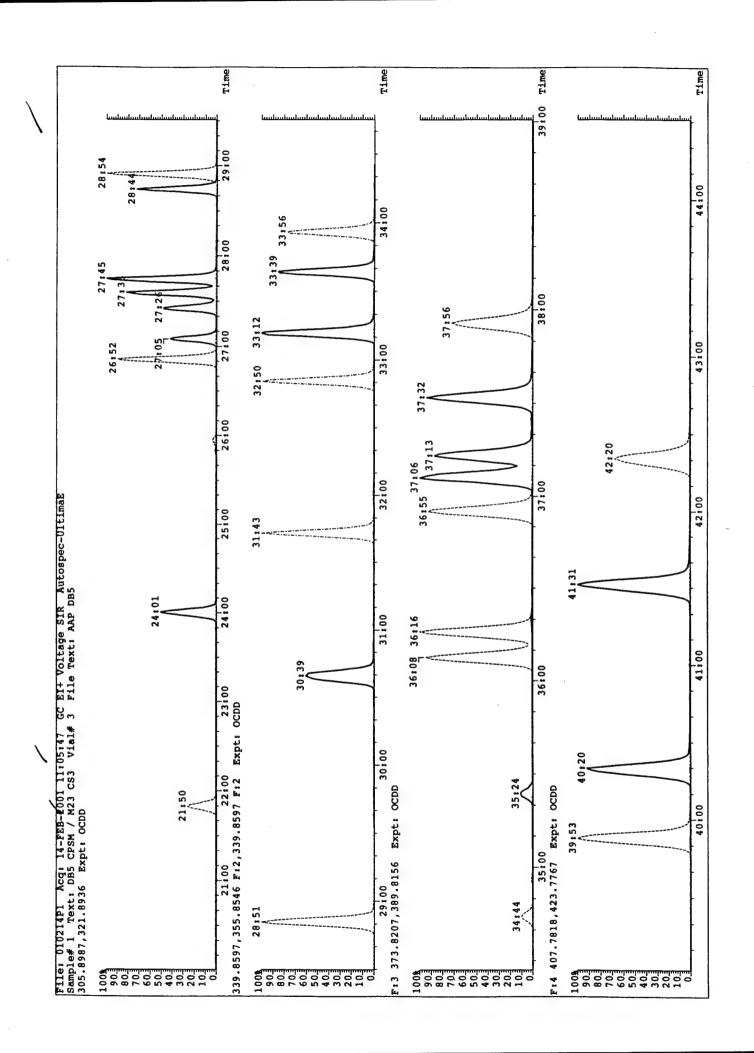
Analyst: 646

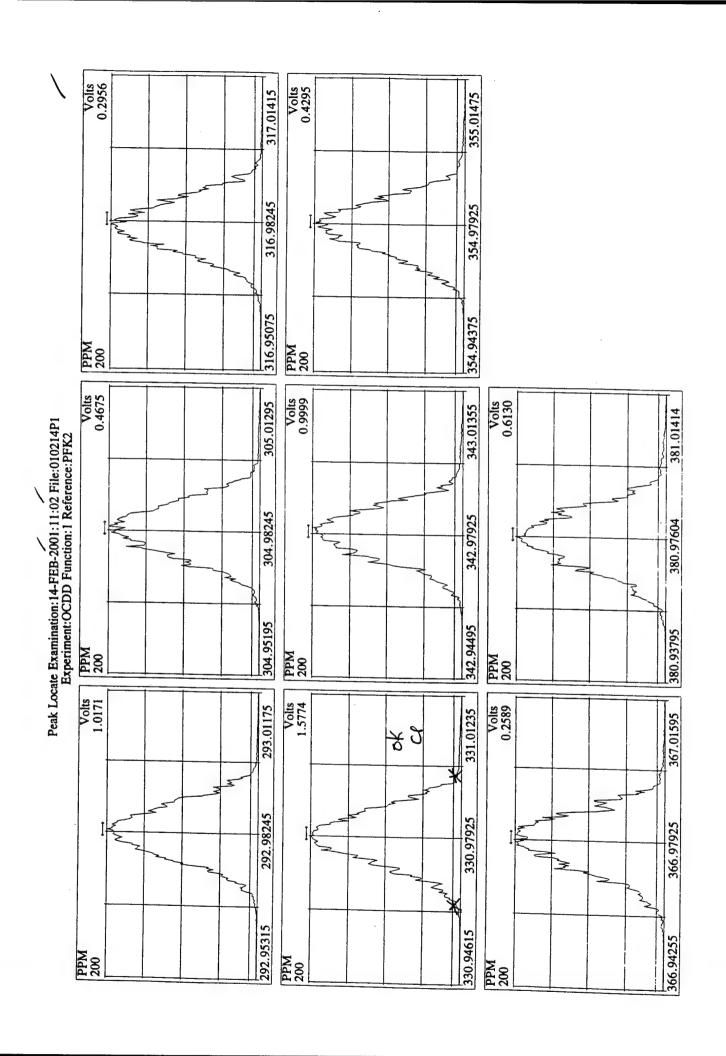
Date: 30 Fcb 01



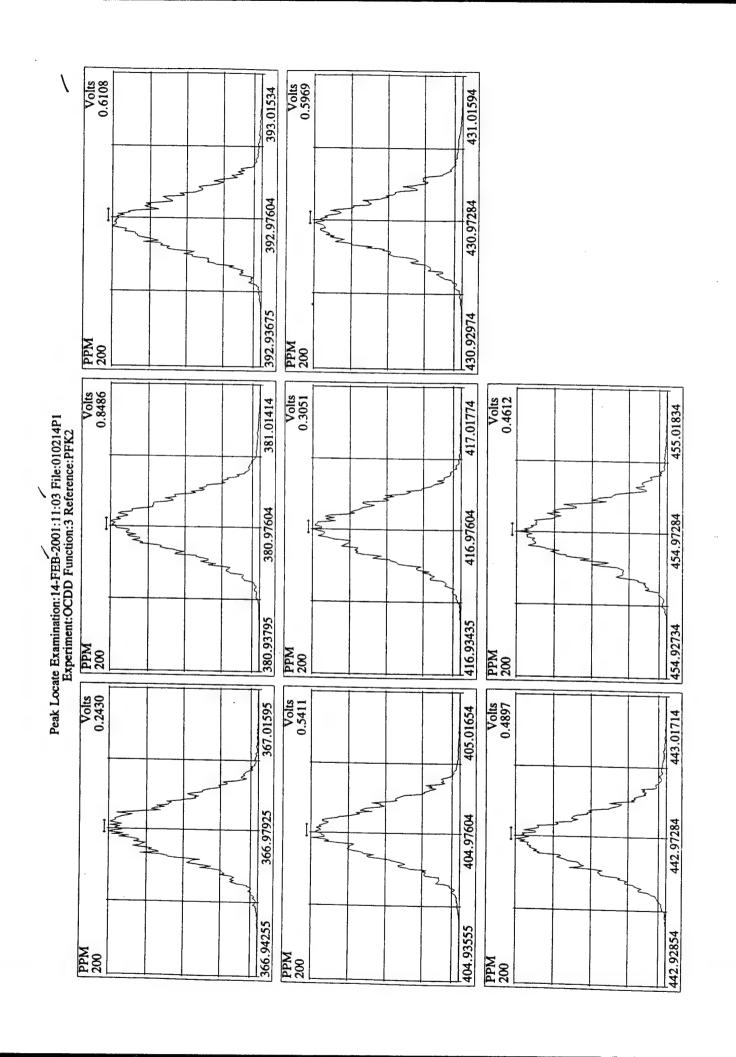
•

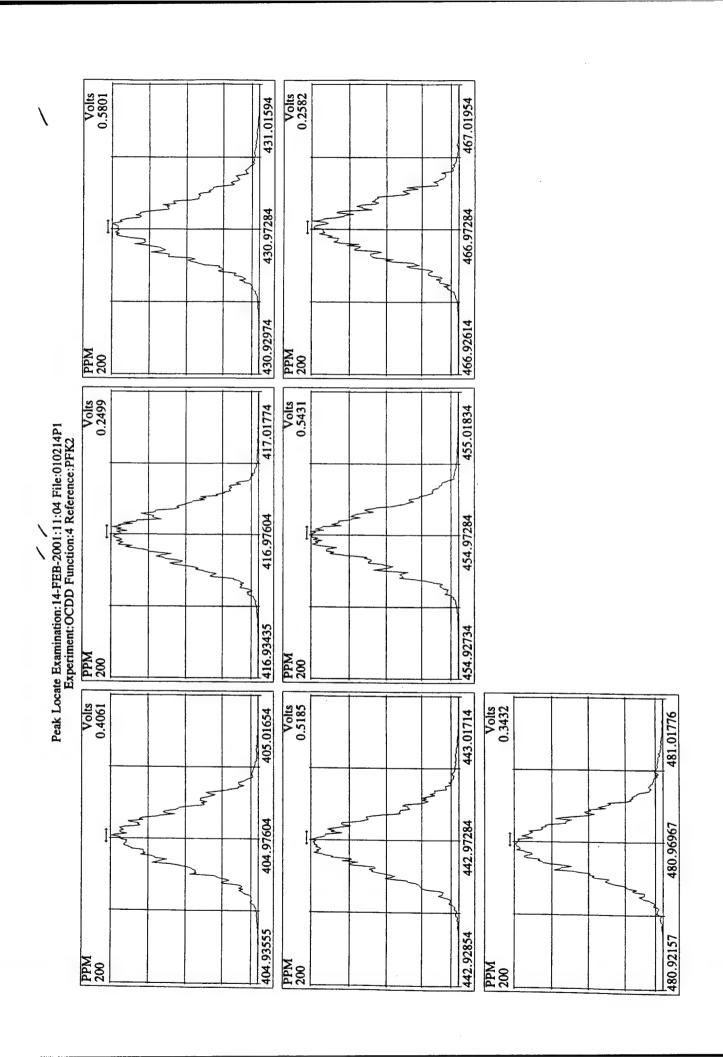
*

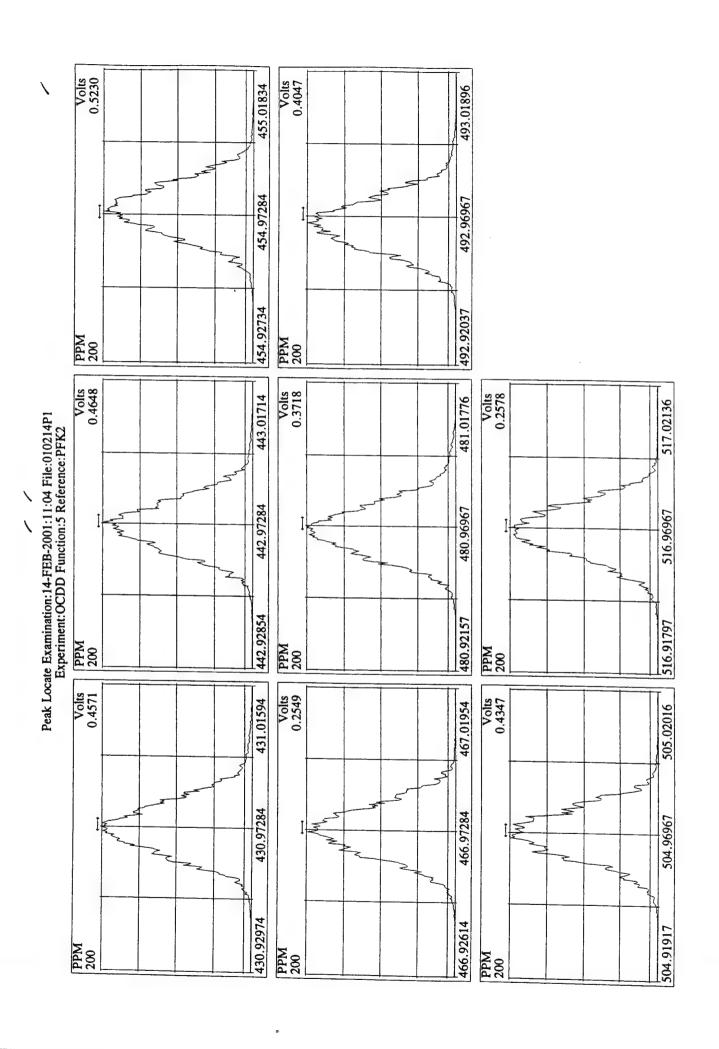


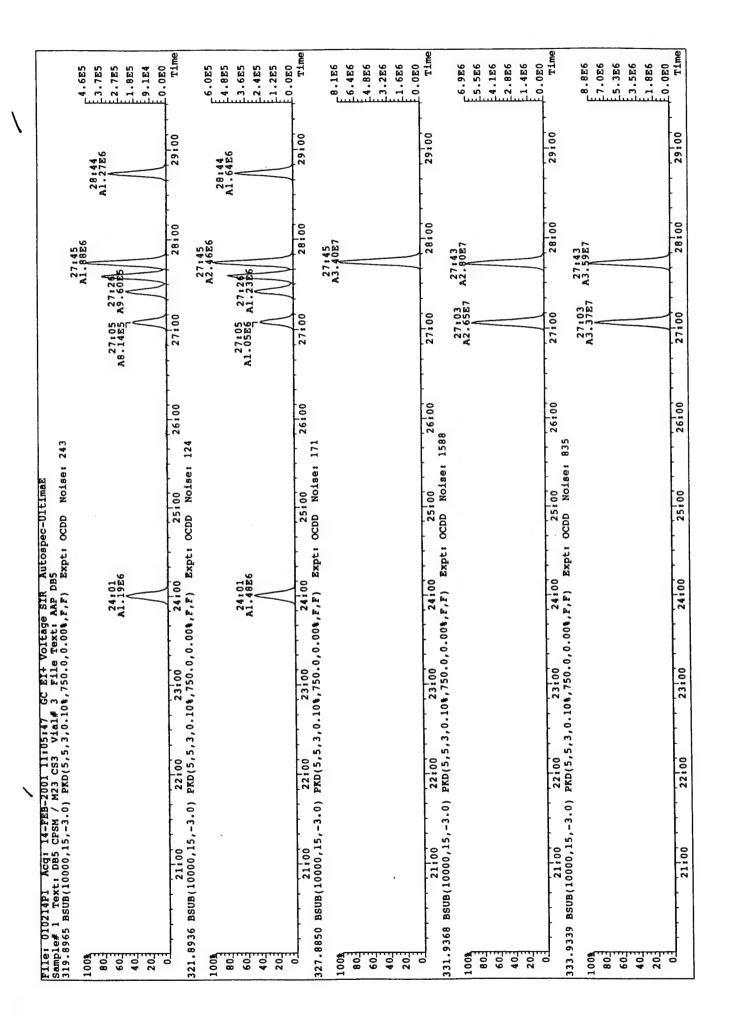


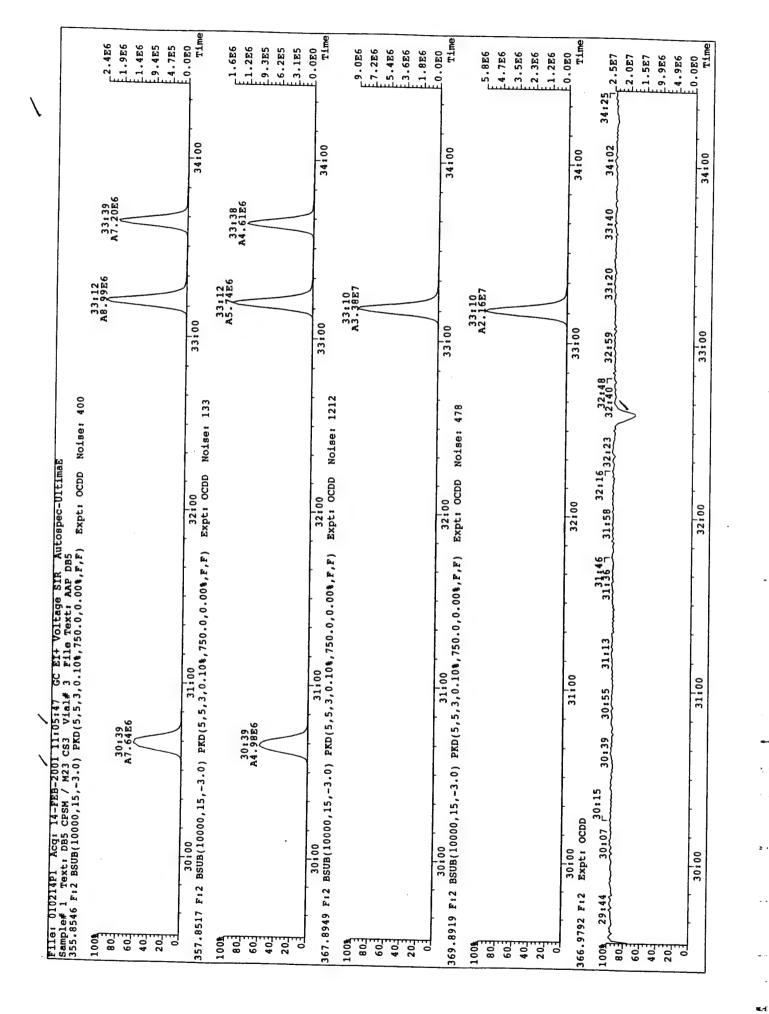
Volts 0.4570 Volts 0.6236 393.01534 355.01475 354.97925 392.97604 392.93675 354.94375 PPM 200 PPM 200 Volts 0.8582 Volts 1.0178 Volts 0.2335 343.01355 381.01414 417.01774 Peak Locate Examination:14-FEB-2001:11:02 File:010214P1 Experiment:0CDD Function:2 Reference:PFK2 342.97925 380.97604 416.97604 3 342.94495 380.93795 416.93435 PPM 200 PPM 200 PPM 200 Volts 1.1364 Volts 0.3424 Volts 0.4733 331.01235 405.01654 367.01595 330.97925 366.97925 404.97604 Z 330.94615 366.94255 404.93555 PPM 200 PPM 200 PPM 200





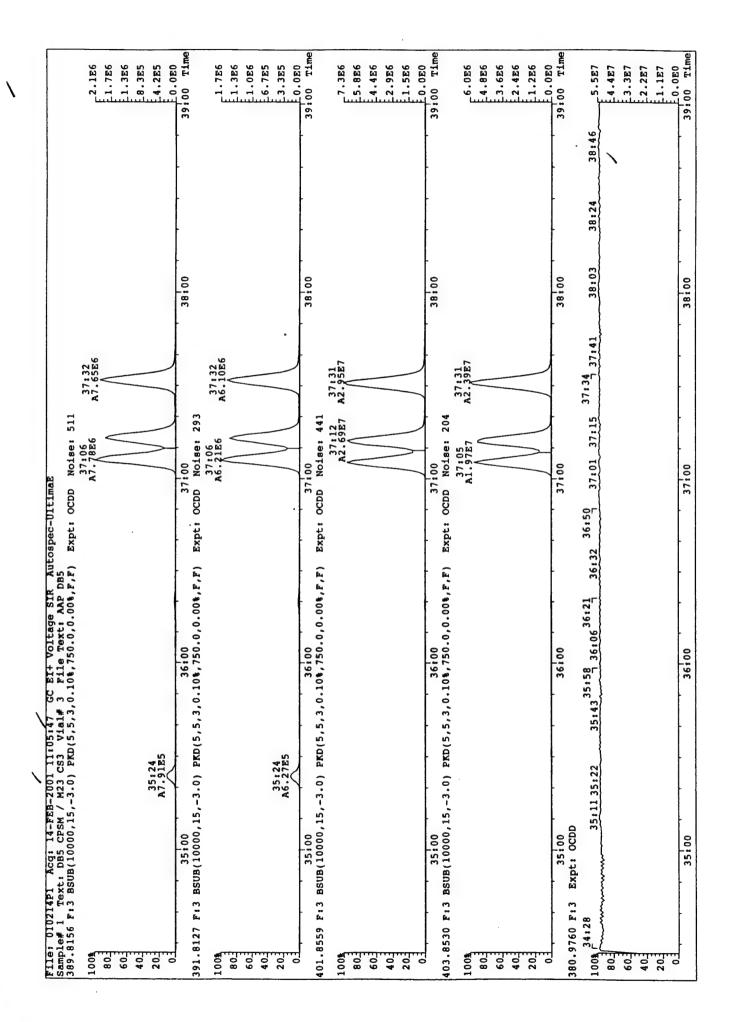


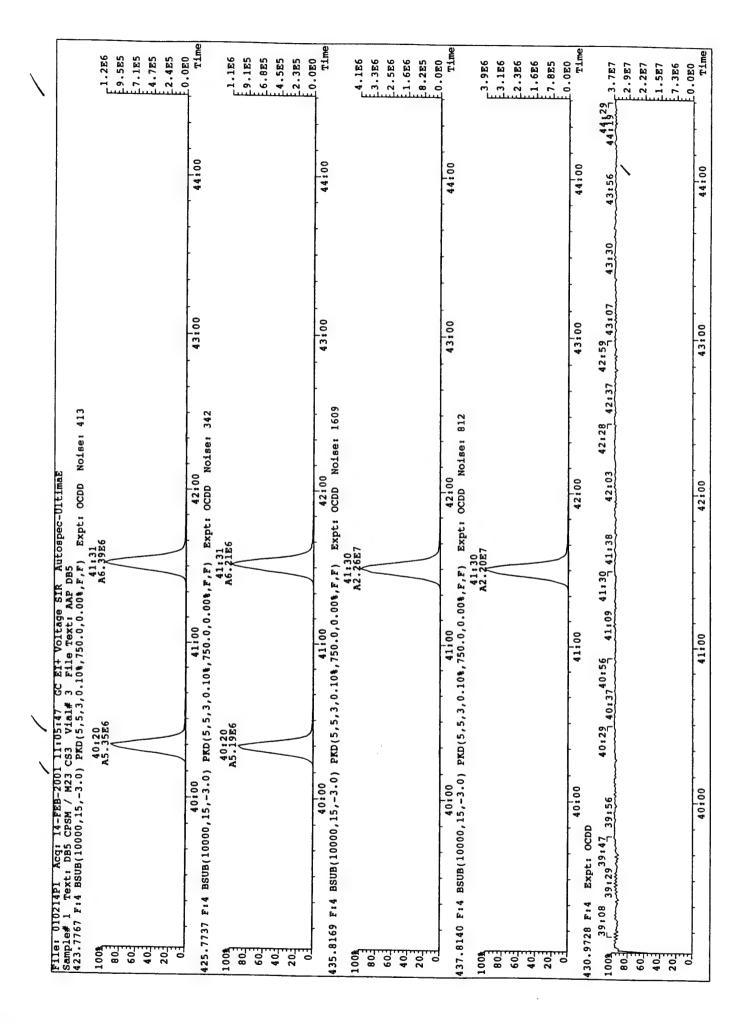


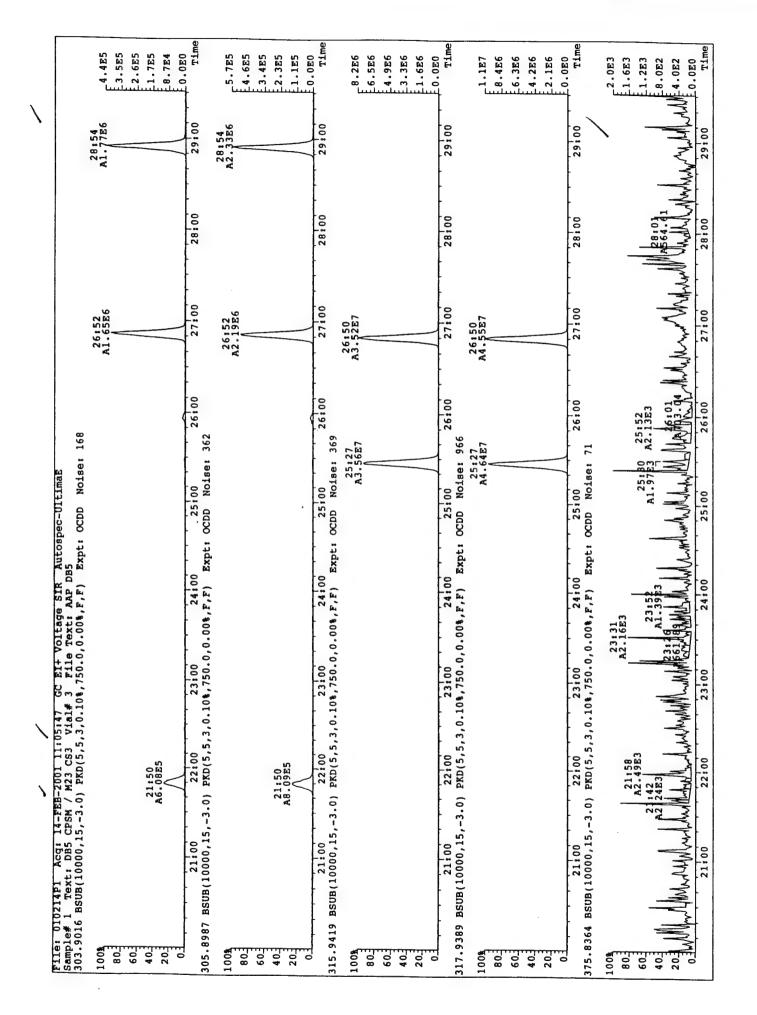


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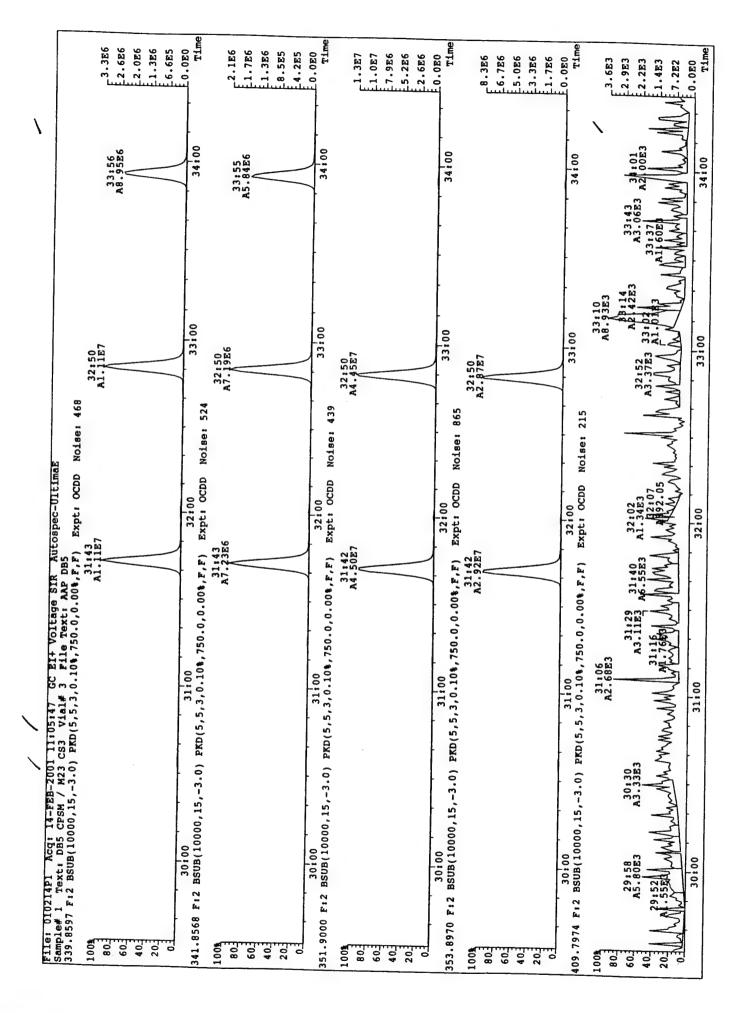
w.d



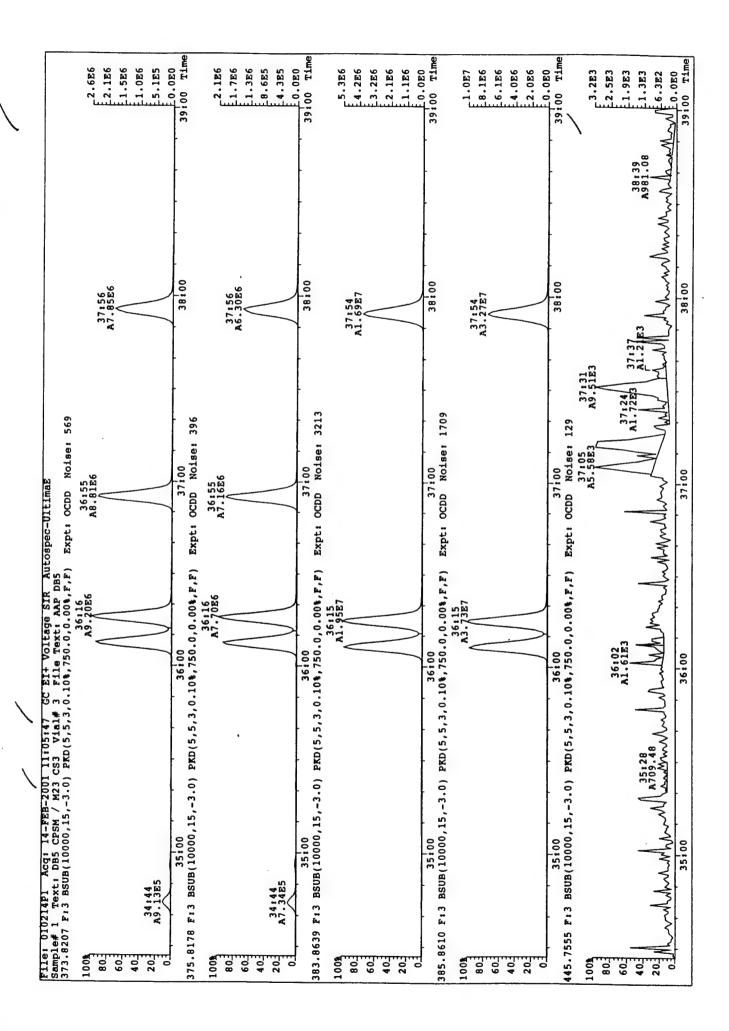




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\		1.586	281.6	3.025	44:00 Time	1.526	1.256	6.085	3.0	44:00 Time	2.6E6	1.556	5.155	44:00 Time	926.53	E4.7E6	2.456	44:00 Time	3.483	43:32 A785-991	WALLEAU WINNEY TO WAY TO OBE
					43:00					43:00				43:00				43:00	•	MANA A MAL A STATE	43.00
	tospec-UltimaE Expt: OCDD Noise: 376	42,20	A8:0/58		42:00 Expt: OCDD Noise: 389		42:20 A5.97E6			Expt: OCDD Noise: 519	42,20	AI:03E/		42:00 Expt: OCDD Noise: 849		42:19 A2.40E7		42:00 Expt: OCDD Noise: 313	31 3E4	41:56 42:19 A1:44E3 A2:08E8 WMM M M M M M	42:00
	GC E1+ Voltage SIR Au # 3 File Text: AAP DB5 3,0.10%,750.0,0.00%,F,F)				41:00 PKD(5,5,3,0.10%,750.0,0.00%,F,F)				00,11	PKD(5,5,3,0.10%,750.0,0.00%,F,F)				41:00 PKD(5,5,3,0.10%,750.0,0.00%,F,F)				41:00 PKD(5,5,3,0.10%,750.0,0.00%,F,F)	41: 40:58 Al.3 A2.61E3 I	-	41100
\	File: 010214P1 Acq: 14-FEB-2001 11:05:47 GC EI+ Voltage SIR Autospec-UltimaE Sample# 1 Text: DB5 CPSM / M23 CS3 Vial# 3 File Text: AAP DB5 407.7818 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,750.0,0.00%,F,F) Expt: OCDD	A7.37E6			0:	39153 A7.23E6			40:00	6	AI. 4E			40:00 BSUB(10000,15,-3.0) PKD(5,5,3	A2.78E7			40:00 BSUB(10000,15,-3.0) PKD(5,5,3		AS: 37.83 AS: 5883 AZ: 3583 AND AND AND AND AND AND AND AND AND AND	40,00
	File: 010214P1 Sample# 1 Text 407.7818 F:4 BS1	#001 08	40	20-	409.7788 F:4 BSU	100%	600	40.	0	417.8253 F:4 BSU	80	40	20-	8220 F:4	100%	09	20-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1	.7165 F:4	1008 803	A1 39124	A MAN AS A PO

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1.4E6 1.1E6 1.1E6 1.8.3E5 1.5.E5 1.8E5	49:00 Time 1.6E6 1.3E6 9.5E5 6.3E5 0.0E0	49:00 Time 2.5E6 2.0E6 1.5E6 5.0E5	49:00 Time 2.8E6 2.3E6 1.7E6 1.1E6 5.7E5	49:00 Time 9.8E4 7.9E4 5.9E4 5.9E4	49:00 Time
	48:00	48:00	48:00	48:00	48:00
ge SIR Autospec-UltimaE .: AAP DB5 0.00%,F,F) Expt: OCDD Noise: 181 47:10 A9.79E6	Expt: OCDD Noise: 273 47:10 A1:11E7	Expt: OCDD Noise: 114 47:09 A1:78E7	Expt: OCDD Noise: 1887 47:09 A2.01E7	47:00 Expt: OCDD Noise: 94	47:00
05:47 GC EI+ Voltage SIR Auto Vial# 3 File Text: AAP DB5 (5,5,3,0.10%,750.0,0.00%,F,F)	0.00%, F, F)	46:00 PKD(5,5,3,0.10%,750.0,0.00%,F,F)	0.00%, F, F)	0.00%, F, F)	46:00
File: 010214Pl Acq: 14-FEB-2001 ll:05:47 GC EI+ Volta Sample# 1 Text: DB5 CPSM / M23 CS3 Vial# 3 File Text 441.7428 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,750.0, 100% 80_ 60_ 60_ 60_ 60_ 60_ 60_ 60_ 60_ 60_ 6	443.7398 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,750.0,10%,750.0) PKD(5,5,3,0.10%,750.0,40	453.7830 F:5 BSUB(10000,15,-3.0) PKD(1008 603 403 0	455.7801 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,750.0, 100%	46i00 513.6775 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,750.0, 100% 803 603 403	45:00

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	Page 7 of 7																	
			Reviewer:	Date: 24 Rb Ø1													Analyst: Off	Date: 20 PSD
					6:16:11	CONC. RANGE (ng/mL)	3.75 - 6.25	18.75-31.25	18.75-31.25 18.75-31.25 18.75-31.25	18.75-31.25	37 - 65	3.75 - 6.25	18.75-31.25 18.75-31.25	18.75-31.25 18.75-31.25 18.75-31.25 18.75-31.25	18.75-31.25 18.75-31.25	35 - 65		
	ATION	.ves			Analysis Date: 14-FEB-01 Time: 16:16:11	CONC. FOUND	5.20	26.07	25.54 / 25.48 / 25.82 / 25.82	24.53 /	50.91	4.50	23.69 / 23.63 /	24.61/ 24.34/ 24.75/ 24.73/	23.58	47.75 /		
	VERIFIC	Perspectives			91 14-F	Pass	γ	Α.	> > >	>	7	Y	> >	> > > >	>> >	γ		
Page 1	PCDD/PCDF CALIBRATION VERIFICATION	Alta Analytical Pe		GC Column ID: DB-5	alysis Dat	QC LIMITS	0.65-0.89	1.32-1.78	1.05-1.43 1.05-1.43 1.05-1.43	0.88-1.20	0.76-1.02	0.65-0.89	1.32-1.78	1.05-1.43 1.05-1.43 1.05-1.43 1.05-1.43	0.88-1.20 0.88-1.20	0.76-1.02		
)/PCDF C	Alta An	00/50,	Column	S#7 A	ION ABUND. RATIO	0.78	1.52	1.25	1.03	0.88	97.0	1.53	1.22 1.22 1.21 1.21	1.02	0.88		
01 12:36	PCDI		Initial Calibration Date: 10/05/00		e: 010214P1	M/Z'S FORMING RATIO	M/M+2	M+2/M+4	M+2/M+4 M+2/M+4 M+2/M+4	M+2/M+4	M+2/M+4	M/M+2	M+2/M+4 M+2/M+4	M+2/M+4 M+2/M+4 M+2/M+4 M+2/M+4	M+2/M+4 M+2/M+4	M+2/M+4		
20-FEB-2001			al Calibrat	Instrument ID: MM-1	VER Data Filename: 010214P1	NALYTES	-TCDD	, 8-PeCDD	1,2,3,4,7,8-HxCDD 1,2,3,6,7,8-HxCDD 1,2,3,7,8,9-HxCDD	1,2,3,4,6,7,8-HpCDD M+2/M+4		TCDF	8-PecDF 8-PecDF	1,2,3,4,7,8-HxCDF 1,2,3,6,7,8-HxCDF 2,3,4,6,7,8-HxCDF 1,2,3,7,8,9-HxCDF	1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF			
OPUSquan			Initi	Instr	VER DA	NATIVE ANALYTES	2,3,7,8-TCDD	1,2,3,7,8-PeCDD	1,2,3,4, 1,2,3,6,	1,2,3,4,	осър	2,3,7,8-TCDF	1,2,3,7,8-PeCDF 2,3,4,7,8-PeCDF	1,2,3,4,1,2,3,6,1,2,3,4,6,1,2,3,7,6	1,2,3,4,	OCDF		

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PCDD/PCDF CALIBRATION VERIFICATION

Alta Analytical Perspectives

Initial Calibration Date: 10/05/00

GC Column ID: DB-5 Instrument ID: MM-1

VER Data Filename: 010214Pl S#7 Analysis Date: 14-FEB-01 Time: 16:16:11

Date: 24 E56

Reviewer:

ě.	M/Z'S FORMING	ION ABUND.	8		CONC.	CONC. RANGE	
LABELED COMPOUNDS	RATIO	RATIO	LIMITS	Pass	FOUND	(ng/mr)	
13C-2,3,7,8-TCDD	M/M+2	0.79	0.65-0.89	>	95.8	70.0 - 130.0	
13C-1,2,3,7,8-PeCDD	M+2/M+4	1.55	1.32-1.78	>	99.7	70.0 - 130.0	
13C-1,2,3,6,7,8-HxCDD	M+2/M+4	1.26	1.05-1.43	>	91.9 /	70.0 - 130.0	
13C-1,2,3,4,6,7,8-HpCDD	M+2/M+4	1.04	0.88-1.20	>	94.5	70.0 - 130.0	
13C-0CDD	M+2/M+4	0.90	0.76-1.02	>	95.8	70.0 - 130.0	
13C-2, 3, 7, 8-TCDF	M/M+2	0.77	0.65-0.89	· ^	92.1	70.0 - 130.0	
13C-1,2,3,7,8-PeCDF	M+2/M+4	1.55	1.32-1.78	>	92.4/	70.0 - 130.0	
13C-1,2,3,6,7,8-HxCDF	M/M+2	0.52	0.43-0.59	· >-	80.4		
13C-1,2,3,4,6,7,8-HpCDF	M/M+2	0.44	0.37-0.51	>	82.3		
13C-OCDF	M+2/M+4	0.89	0.76-1.02	^	89.4	70.0 - 130.0	
37C1-2,3,7,8-TCDD					102.4	75.0 - 125.0	
13C-2,3,4,7,8-PeCDF	M+2/M+4	1.56	1.32-1.78	٨	103.1	75.0 - 125.0	
13C-1,2,3,4,7,8-HxCDD	M+2/M+4	1.25	1.05-1.43	>	105.1	75.0 - 125.0	
13C-1,2,3,4,7,8-HxCDF	M/H+2	0.51	0.43-0.59	>	106.5	75.0 - 125.0	
13C-1,2,3,4,7,8,9-HpCDF	M/M+2	0.44	0.37-0.51	٨	105.2	75.0 - 125.0	
13C-1,2,3,7,8,9-HxCDF	M/M+2	0.51	0.43-0.59	*	88.0 /	88.0 / 75.0 - 125.0	

Analyst: 6H5

Date: 30 Fe 60/

OPUSquan	20-FEB-2001 12:37		Page 1			١	\				
Client ID; DB	ID: DB5 CPSM / M23 CS3		Filename: 0102 GC Column ID:	010214P1 ID: db-5	S: 7 ICal	7 Acq: 14-FEB-01 ICal: MM1_M23_0:	16:16:11 wt/vol: 1.000	0	Concal	010214P1- 010214P1-	Page 7 of 7
	Name 2,3,7,8-TCDD 1,2,3,7,8-PeCDD	Resp 4.10e+06 1.40e+07	RA 0.78 y 1.52 y	RRF 1.26 1.01	RT 27:44 33:11	Conc Qualif 5.20 26.1	. CDE	18e 793 726	DL DL DL 0.0176		
	1,2,3,6,7,8-HxCDD			1.02	37:13	25.5 25.8		945 945 245 2		Roufower	3
	1,2,3,4,6,7,8-HpCDD ocdD	1.18e+07 1.83e+07		1.13	41:30	24.5		100		2.4	Tab of
	2,3,7,8-TCDF	3.57e+06	0.76 ×	1.05	26151	4.50		1398 2.5		Date	}
	2,3,4,7,8-PeCDF			1.05	32:50	23.6		77	0.0395		
	1,2,3,6,7,8-HXCDF		1.22 y	1.24	36:15	24.3		3321 2.5 3321 2.5			
	2,3,4,6,7,8-HxCDF 1,2,3,7,8,9-HxCDF	1.48e+07	1.21 y	1.16	36155	24.7	. •	2 0			
	1,2,3,4,6,7,8-HpCDF		, A	1.54	39:52	23.6		7 7			
→	, 2, 3, 4, 1, 8, 9-HPCDF OCDF	1.14e+07 1.98e+07		1.30	42:20 47:09	23.6		3009 2.5 1658 2.5			
Ě	Total Tetra-Dioxing	1.640+07	v 77 v	1.26	23.60	9				EMPC	
Ť	Total Penta-Dioxing	3.71e+07	.54	1.01		0.69		, ,	0.0319	69.2	
Ė	Total Hexa-Dioxing	3.75e+07	>-	1.10	35:23	79.6	1	945 2.	0.0909	80.1	
1	Total Tetra-Furans	9.06e+06	> >	1.13	40:19	11.4	7	2277 2.5 1398 2.5	0.152	45.7	
1st	Fnc.	1.66e+07		1.05	ŭ	23.1	. 2	814 2.	0.0872	23.2	
	Total Penta-Furans PeCDF Totals:	4.81e+07		1.05	31:43	66.9 90.0	П	2.	0.0398	r 0	
r	Total Hexa-Furans Total Hepta-Furans	5.94e+07 2.49e+07	1.22 y 1	1.14	34:44	102	.,, (**	3321 2.5	0.0813	102	
			,		١.		•	•	•	Rec 47.0	
•	13C-2,3,7,8-TCDD	6.26e+07	1		27:43	95.8					
130-	13C-1,2,3,6,7,8-FECDD	4.28e+07	1.26 V 0	56.0	ש ה	99.7				12.66	
13C-1,	13C-1,2,3,4,6,7,8-HpCDD		* >-		41:29	94.5				94.5	
	13C-0CDD		>	.73	46:49	95.8				95.8	
13	13C-1,2,3,7,8-TCDF	7.58e+07	× >	90*	26:49	92.1					
13C-	.1,2,3,6,7,8-HXCDF			.28	36:14	80.4				92.4	
130-1,	13C-1,2,3,4,6,7,8-HpCDF		۲,	.90	39:51	82.3				82.3	
	13C-0CDF	3.62e+07		.81	47:08	89.4					
RS/RT	13C-1,2,3,4-TCDD	.76e+07	0.80 yr 1	. 00	27:03	100					
RS/RT 13C-	13C-1,2,3,4-TCDF	7.76e+07 4.99e+07	~>	8 8	25:26	100				ı	
			•			9				Analyst: 6	0,40
13	37C1-2,3,7,8-TCDD 13C-2,3,4,7,8-PeCDF	3.30e+07 6.90e+07	¥	0.51 2	37:44	102				102	
130-	1,2,3,4,7,8-HxCDD	4.15e+07	1.25 y 0		37:05	105				105 Date: 20FC601	1090
130-1	1,2,3,4,7,8-HXCDF 2,3,4,7,8,9-HpCDF	4.98e+07 3.33e+07	。。 〉	.91	36:06	106 105				1061	-
13C-	1,2,3,7,8,9-HXCDF	4.69e+07	.51 2/ 12	.07	17:54	88.0				88.0 /	

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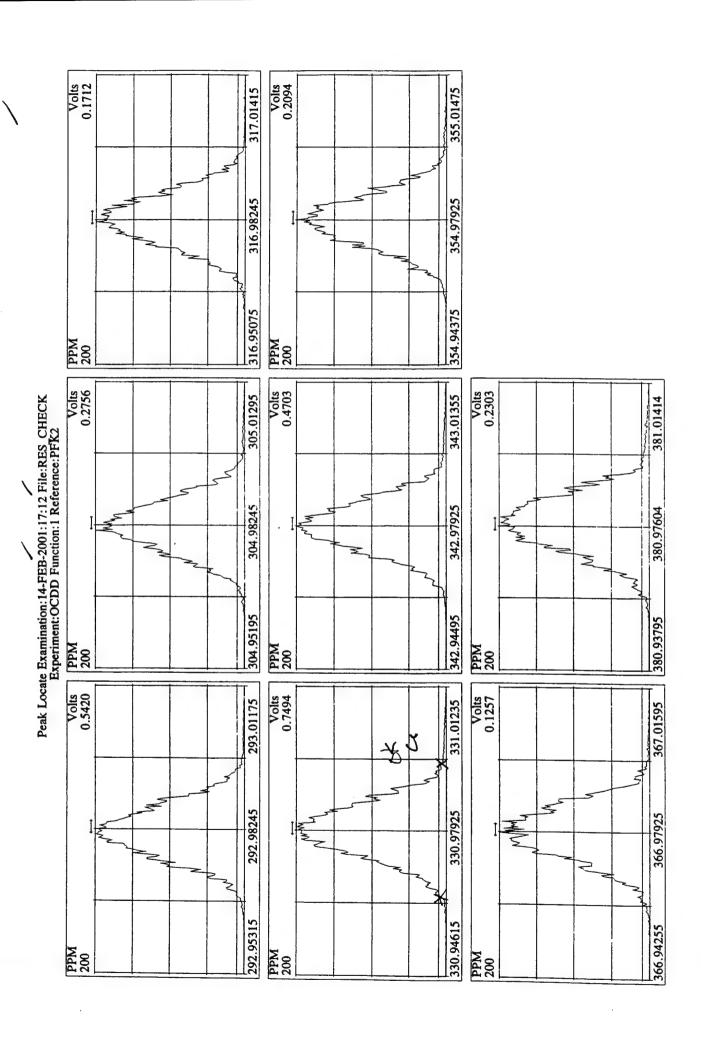
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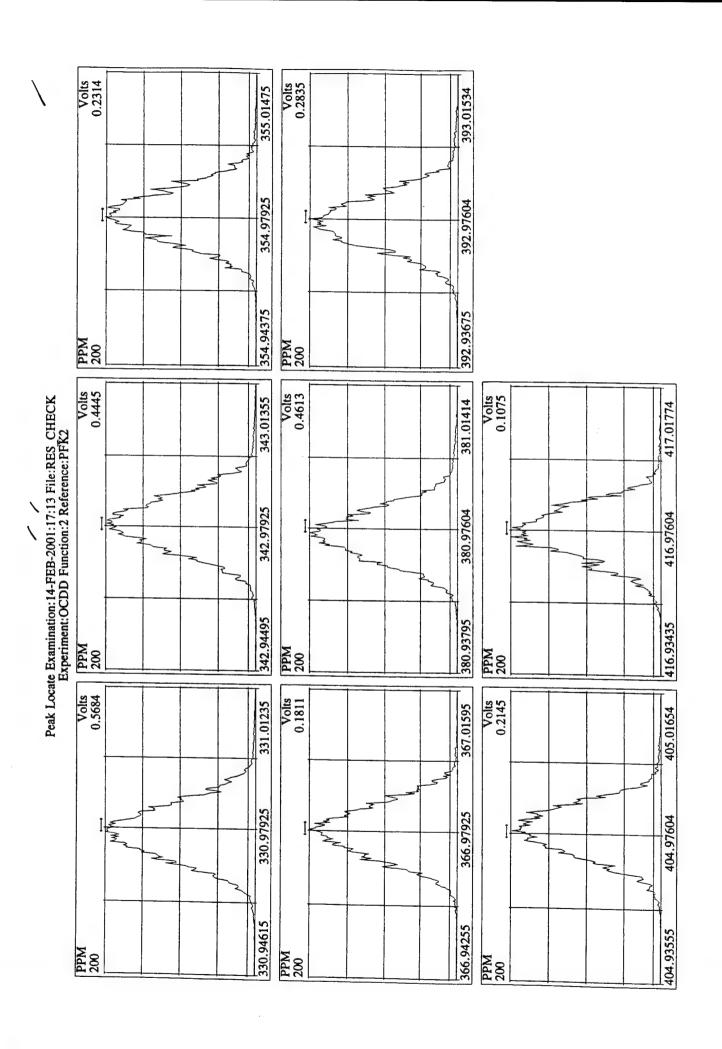
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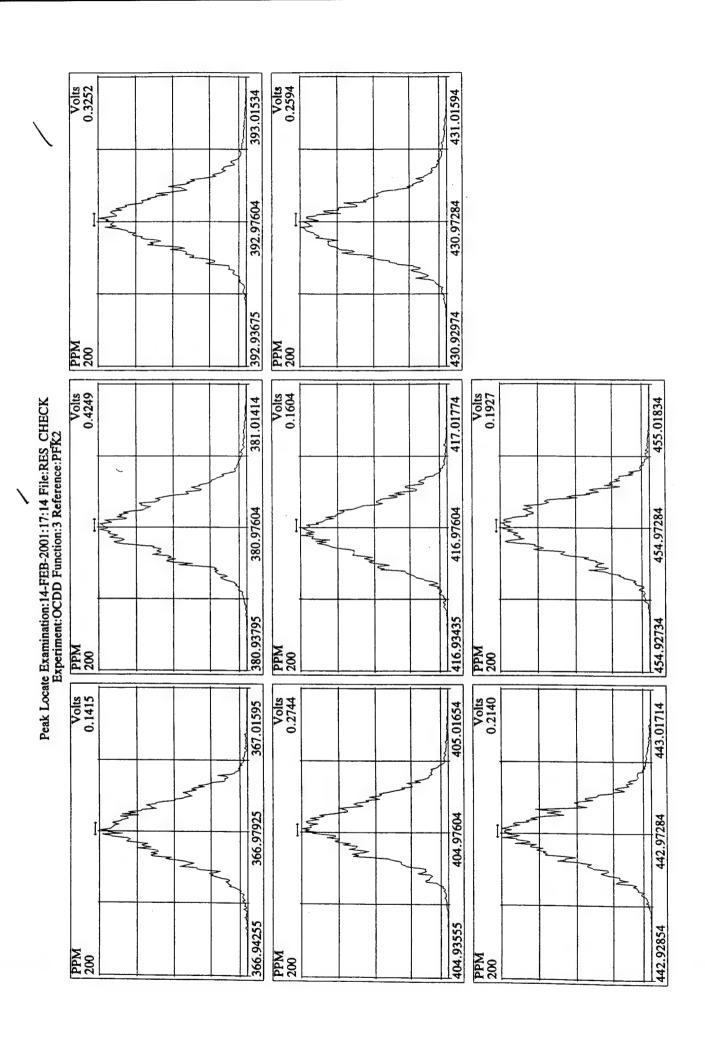
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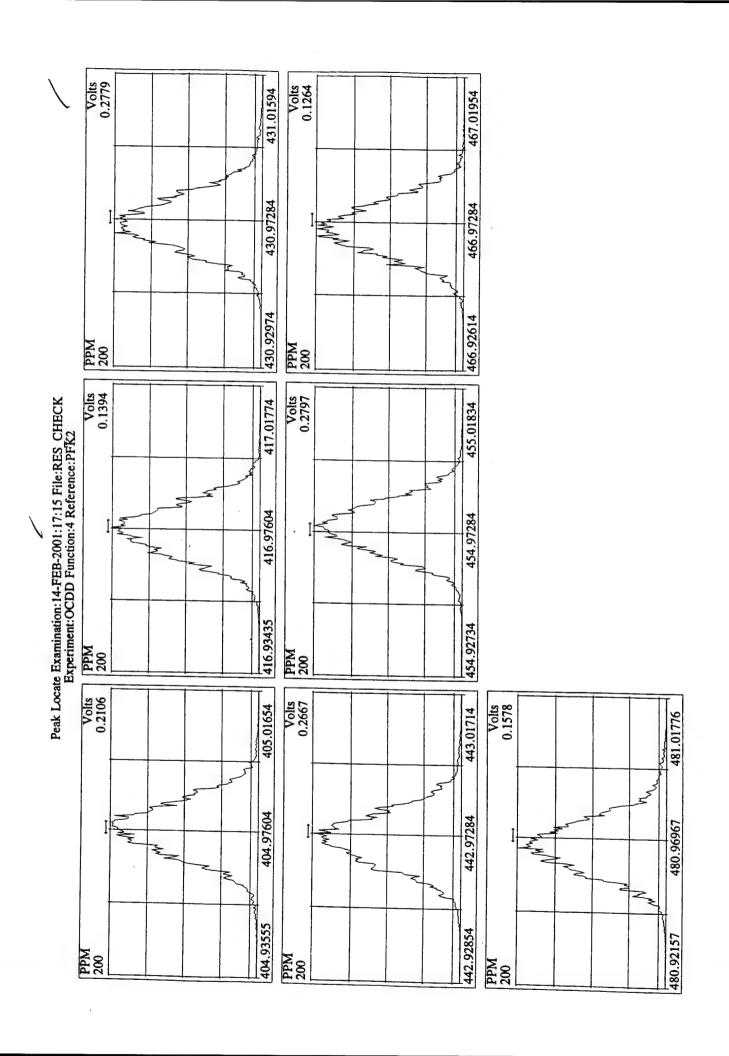
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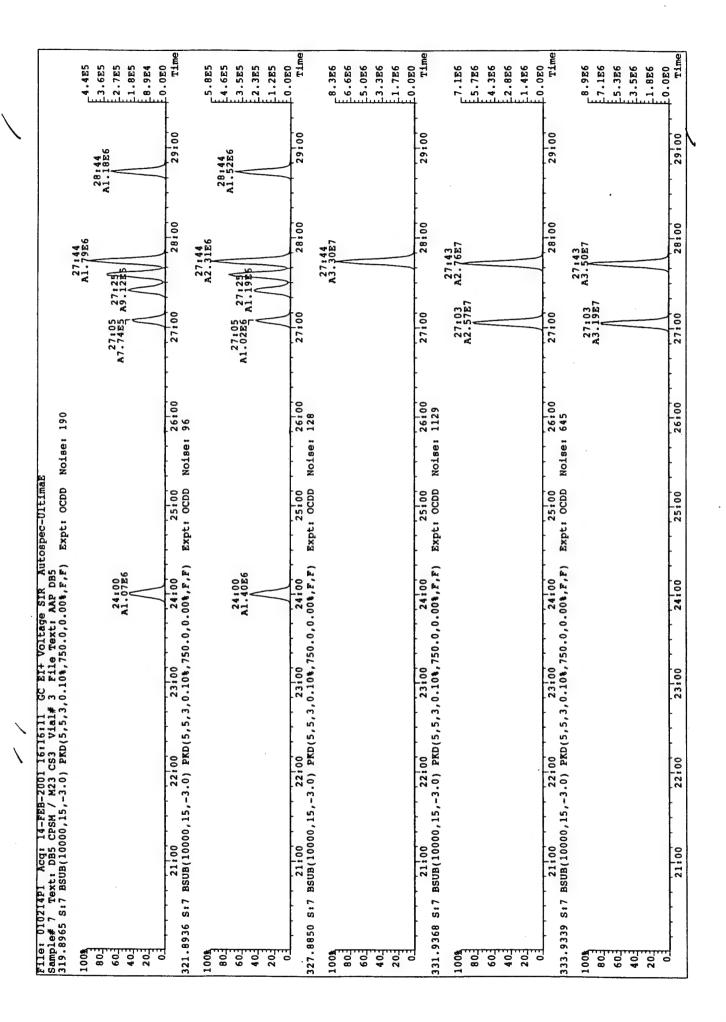


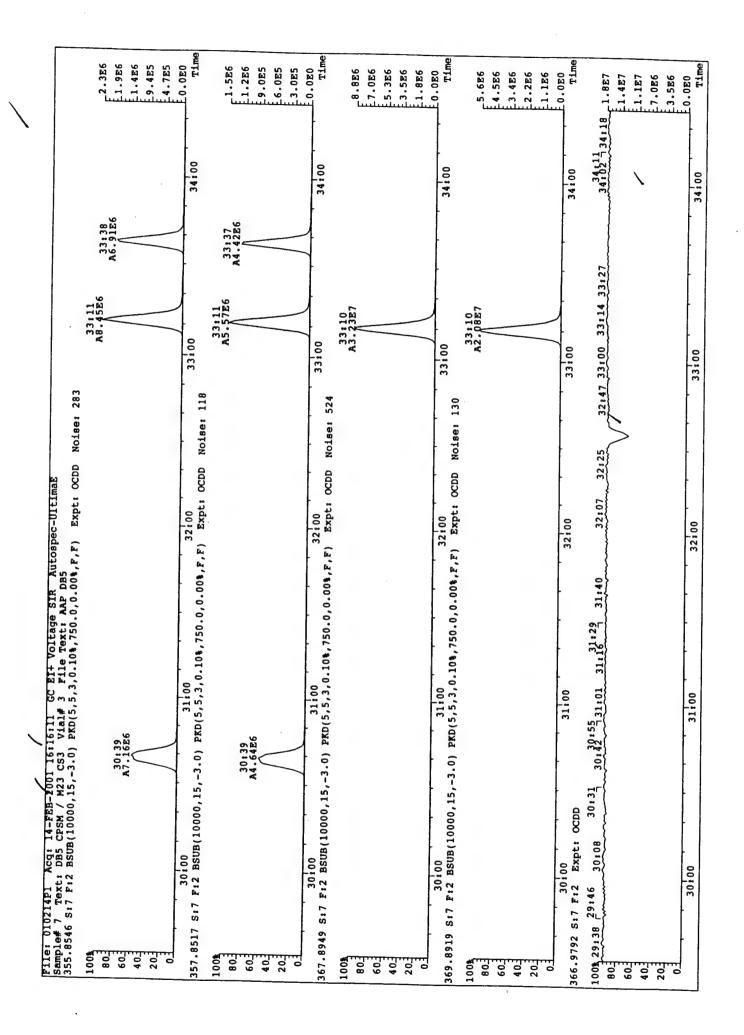






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	1.856	1.586	1.126	7.325	3.755	_	39:00 Time		1.486	2 1		E5.7E5	£2.9E5	20,00		742	0 4 F	3.886	2 4 5 5	1 386	0 60 0	39:00 Time		F5.2E6	£4.2E6	3.1E6	£2.1E6	1.086	39:00 Time	3	38:37 38:59 4.0E7	3.257		1.657	8.056	20.0E0
							38:00							00,00	00.00							38:00							18,00		38:05 38:27		•			00,00
maE CCDD Noise: 371	37:06 A6.91E6 37:31							EXPC: OCUP NOIBE: 304							OCDD Noise: 254	37:05						37:00	OCDD Noise:	A1.84E7 A2.23E7					327.00		37:0537:19 37:28 37:43 37:58					00,11
<pre>2214P1 Acq: 14-FEB-2001 16:16:11 GC EI+ Voltage SIR Autospec-UltimaE 7 Text: DBS CPSM / M23 CS3 Vial# 3 File Text: AAP DBS S:7 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,750.0,0.00%,F,F) Expt: OC</pre>								, O. UU&, F, F)							36:00 0.10%,750.0,0.00%,F,F) Expt:								10%,750.0,0.00%,F,F) Expt:						20,00		36:09 36:25 36:41 36:48	}				
EB-2001 16:16:11 GC EI+ / M23 CS3 Vial# 3 File 00,15,-3.0) PKD(5,5,3,0.1					35:23	A/.3463	36	BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,/50.0					35:23 A5.61E5	-	35:00 BSUB(10000,15,~3,0) PKD(5,5,3,0,10%,750.0							36	BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,750.0						36		35:34 35:42 35:59					
File: 010214Pl Acq: 14-Fl Sample# 7 Text: DB5 CPSM 389.8156 S:7 F:3 BSUB(100	100%	E08	09	40	203	-0	. 1	8127 St7 Ft3	1008	708	Ę09	404	203	0	35:00 401.8559 S:7 F:3 BSUB(1000		100%	F08	F0.0	707	205	-	403.8530 S:7 F:3 BSUB(100	100%	80=	09	40	203	0.3	380,9760 Si7 Fi3 Expt: OCDD	34.40		09	£0.	203	0

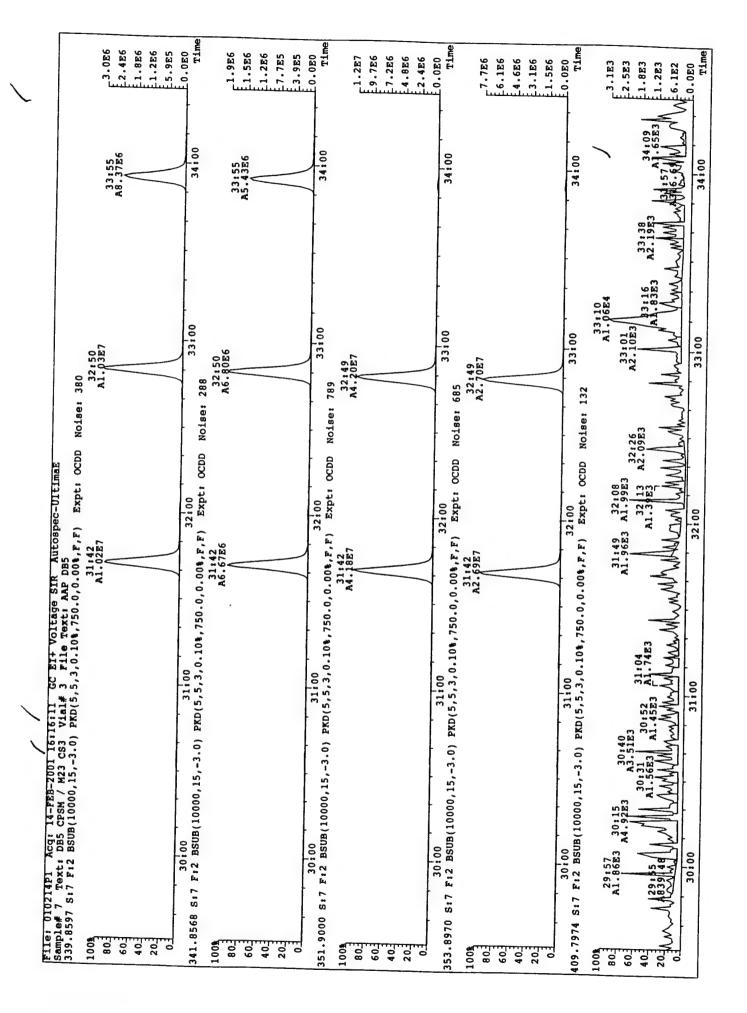
7

1.1E6 8.4E5 6.3E5 4.2E5 2.1E5	49	6.	66	48:12 48:36 48:454	00 .0E0
312	160	130 48:00	105	24 47:45 47:59	48:00
AAP DBS .0,0.00%,F,F) Expt: OCDD Noise: 46:50 A8.56E6	47:00 0,0.00%,F,F) Expt: OCDD Noise: 46:51 A9.75E6	47:00 0,0.00%,F,F) Expt: OCDD Noise: 1 46:49 A1.66E7	47:00 Expt: OCDD Noise: 46:49 Al.84E7	46:38 46:53 47:047:12 47:24	47:00
3 Vial# 3 File Text: AA.	45:00 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,750.0,0	08,750.	45:00 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,750.0,0.00%,F.F)	45:51 01 46:09	46:00
Sample# 7 Text: DB5 CPSM / M23 CS3 Vial# 3 File Text: 457.7377 S:7 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,750.10%,000	45:00 .7348 S:7 F:5 BSUB(10000,15,-3.0	3(10000,15,	45:00 471.7750 S:7 F:5 BSUB(10000,15,-3.0 100% 80 60 40 20	454.9728 S:7 F:5 Expt: OCDD 1008 44:42 45:00 45:09 45:27 803 603 403 603	45:00

21:00 22:00			
A1.5466 A2.1400 A2.	ziwri Acq: 14-FEB-2001 leiteill GC El+ Voltage SlR Autospec-UltimaE Text: DBS CPSM / M23 CS3 Vial# 3 File Text: AAP DBS S:7 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,750.0,0.00%,F,F) Expt: OCDD Noise:		
21100 22100		28:54 Al.73E6	4.055
A21150 22100			2.455
21100 22100			1.6E5
A250256 A273855 A27385 A273855 A27385	21:00 22:00 23:00 23:00 24:00 25:00 25:00 26:00 27:00 8:7 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,750.0,00%,F,F) Expt: OCDD Noise: 284	29:00	Time
21100 21100		28:54 A2.25E6	5.385
21100 22100			4.3E5
21100 22100 22100 23100 24100 24100 25100 25100 27100 27100 28100 29100 29100 29100 29100 2010 20100 2010 201			£2.1E5 £1.1E5
25.22 21100 221	21:00 22:00 23:00 24:00 24:00 25:00 25:00 26:00 27:00 S:7 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,750.0,0.00%,F,F) Expt: OCDD Noise: 253	29:00	Time
21100 22100 22100 24100 24100 8364 817 BSUB(10000,15,-3.0) PRD(5,5,3,0.104,750.0,0.004,F.F) Expt. CCDD Noise: 568	25:26 A3.36E7		7.9E6
21100 21100			£6.3E6 £4.7E6
25100 25100			3.156
21100 Si7 BSUB(10000,15,-3.0) PRD(5,5,3,0.104,750.0,0.004,F,F) Expt. OCDD Noise: 7 406 Si7 BSUB(10000,15,-3.0) PRD(5,5,3,0.104,750.0,0.004,F,F) Expt. OCDD Noise: 7 406 Si7 BSUB(10000,15,-3.0) PRD(5,5,3,0.104,750.0,0.004,F,F) Expt. OCDD Noise: 7 406 Si7 BSUB(10000,15,-3.0) PRD(5,5,3,0.104,750.0,0.004,F,F) Expt. OCDD Noise: 7 406 Si7 BSUB(10000,15,-3.0) PRD(5,5,3,0.104,750.0,0.004,F,F) Expt. OCDD Noise: 7 406 Si7 BSUB(10000,15,-3.0) PRD(5,5,3,0.104,750.0,0.004,F,F) Expt. OCDD Noise: 7 406 Si7 BSUB(10000,15,-3.0) PRD(5,5,3,0.104,750.0,0.004,F,F) Expt. OCDD Noise: 7 406 Si7 BSUB(10000,15,-3.0) PRD(5,5,3,0.104,750.0,0.004,F,F) Expt. OCDD Noise: 7 406 Si7 BSUB(10000,15,-3.0) PRD(5,5,3,0.104,750.0,0.004,F,F) Expt. OCDD Noise: 7 406 Si7 BSUB(10000,15,-3.0) PRD(5,5,3,0.104,750.0,0.004,F,F) Expt. OCDD Noise: 7 406 Si7 BSUB(10000,15,-3.0) PRD(5,5,3,0.104,750.0,0.004,F,F) Expt. OCDD Noise: 7 406 Si7 BSUB(10000,15,-3.0) PRD(5,5,3,0.104,750.0,0.004,F,F) PRD(5,5,3,0.104,F,F) PRD	21:00 22:00 23:00 24:00 25:00 26:00 25:00 25:00 27:00 8:7 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,750,0.00%,F.F) Expt: OCDD Noise: 568	29:00	Time
Si7 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,750.0,0.00%,F,F) Expt. OCDD Noise: 74 Si7 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,750.0,0.00%,F,F) Expt. OCDD Noise: 74 A2.16E3 A2.46E3 A2.16E3 A2.46E3 A2.16E3 A2.16E3 A3.16E3 A2.16E3 A3.16E3 A3.16E3 A3	25:26 A4.40E7		F 1.0E7
21:00 S:7 BSUB(1000, 15, -3.0) PRD(5,5,3,0.10%,750.0,0.00%,F,F) Expt: OCDD Noise: 74 S:7 BSUB(1000, 15, -3.0) PRD(5,5,3,0.10%,750.0,0.00%,F,F) Expt: OCDD Noise: 74 A26:21 A26:21 A26:21 A26:21 A26:38 A37:43 A37:43 A37:48 A77:43			6.186
21:00 22:26 8:7 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,750.0,0.00%,F,F) Expt: OCDD Noise: 74 8:3 20:55 21:16 82:22 25 82:22 25 82:22 25 82:22 25 82:22 25 82:22 25 82:22 25 82:22 25 82:22 25 82:22 25 82:22 25 82:22 25 82:22 25 82:22 25 82:20 25:00 25:			-4.0E6
20:55 21:16 A2:44E3 A2:44E3 A1:09E3 A1:09E3 A1:09E3 A1:53E3 A1:09E3 A1:53E3 A1	21:00 21:00 22:00 23:00 24:00 25:00 25:00 25:00 27:00 S:7 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,750.0,0.00%,F,F) Expt: OCDD Noise: 74	29:00	Time
20:555 21:162 A1:40E3 A836.22 A1:40E3 A836.22 A1:40E3 A1:55E3 A1:05E3 A1:55E3 A1:05E3 A1:55E3 A1:05E3 A1:55E3 A1:05E3 A1:55E3 A1:05E3 A1:55E3 A1:05E3 A1:55E3 A1:05E3 A1:05E3 A1:05E3 A1:05E3 A1:05E3 A1:05E3 A1:05E3 A1:05E3 A1:05E3 A1:05E3 A1:05E3 A1:05E3 A1:05E3 A1:05E3 A1:05E3 A1:05E3 A1:05E3 A1:05E3 A1:05E3 A1:05E3 A1:05E3 A1:05E3 A1:05E3 A1:05E3 A1:05E3 A1:0	22126 3.2 4.85	\	E 1.7E3
21:00 22:00 23:00 23:00 24:00 25:00 25:00 25:00	20:55 21:16 A3.16E3 A3.09E3 A1.09E3 A1.53E3 A1.55E3 A1		1.083
22:00 23:00 24:00 25:00 26:00 27:00 28:00 29:00	Albert Miller Strategie Com Mandell Mandell Mandell Mandell Complex Strategies Strategies Complex Comp	And Moreon from	3.352
	22:00 23:00 24:00 25:00 26:00 27:00	29:00	.

	2.586	2.326	2.0E6	1.5E6	1.326	1.056	E7.6E5	E 5.0E5	2.5E5 E0.0E0	Time	1.656	-1.5E6	1.3E6	1.156	9.855	E 6.5E5	4.985	3.385	1.655	Time	1.587	1.287	1.157	7.7E6	6.256	3.126	1.586	Time
	28151 Al. 02E7									29:00	28150 A6.45E6									29:00	37 28:57							29:00
										28:00										28:00	27:51 28:11 27:29 P 28:11							28:00
										27:00										27:00	26149							27:00
E Noise: 71										26:00 Noise: 148										26100	25:20 25:27 7 26:09							26:00
ospec-UltimaE Expt: OCDD No										25:00 Expt: OCDD No							ı			25:00	24:12 24:36 25:01 25							25:00
oltage SIR Aut ext: AAP DB5 0.0,0.00%,F,F)										24:00										24:00	23,41							24:00
5:11 GC EI+ Vo /1a1# 3 File 1 5,5,3,0.10%,750										22:00 23:00 -3.0) PKD(5.5,3.0,10%,750										23:00	22:36 23:15	*						23:00
-FEB-2001 16:10 SM / M23 CS3 7 ,15,-3.0) PKD(22:00 153.0) PKD(22:00		and a survival and a						22,00
010214PI Acq: 14-FEB-2001 16:16:11 GC EI+ Voltage SIR Autospec-UltimaE e# 7 Text: DBS CPSM / M23 CS3 Vial# 3 File Text: AAP DBS 597 S:7 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,750.0,0.00%,F,F) Expt: OCDD										21:00 S:7 BSUB(10000.15.										21:00 S:7 Expt: OCDD	•	20:48 41:14						21100
File: 0102 Sample# 7 339.8597 S	100%	06	90 F	0.09	501	4 0	30	204	10	8568		06	80	70-	•09 •09	50 S	30	20-	10	316.9824 S	•	803 My My mm	70	50	. 4 	30-1	10	0

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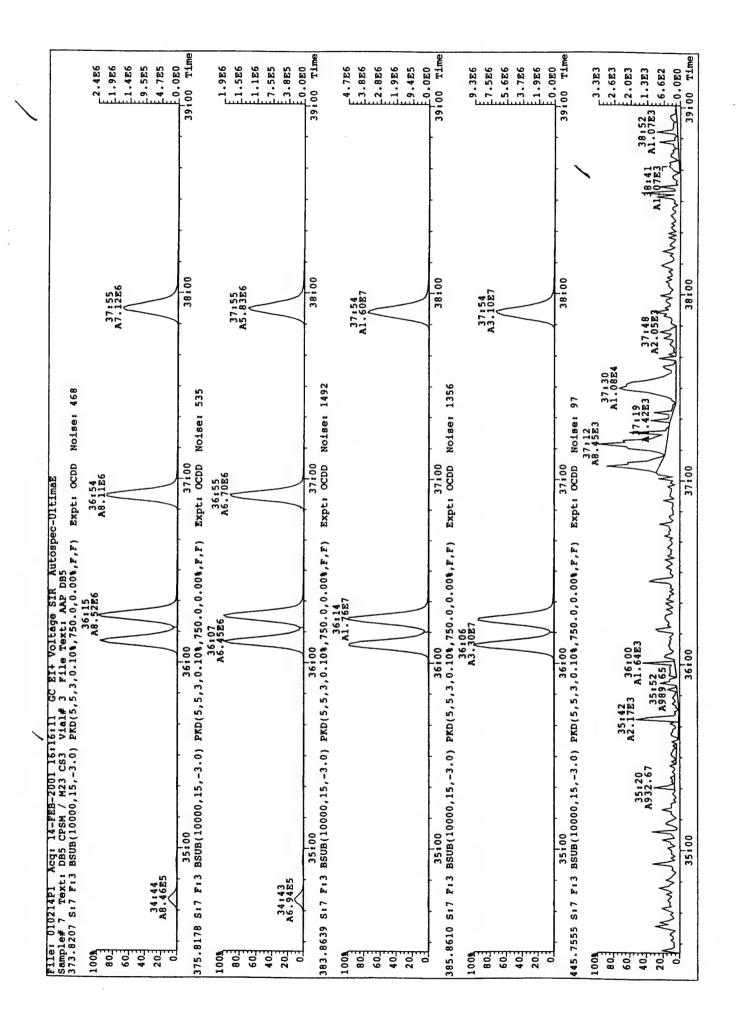
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8-18



	1.4E6 E1.1E6 E8.3E5 E5.5E5 E2.8E5	44:00 Time 1.4E6 1.1E6	44:00 Time	1.3E6 1.3E6 1.3E6 1.5E5 14.5E5	5.256 64.156 13.156 1.056	44:00 F0.0E0	44.27 44.27 2.8E3 9E3 1.1E3 1.1E2 1.1E2
			-				108 43:28 43: 43:1753 43:28 AL.7 43:1754 A.7053
D Noise: 335	42,20 A5.71E6	43:00 Noise: 328 43:00 42:20 A5:66E6	Noise: 424 43:00	A1.01E7	Noise: 733	43:00 Noise: 234	42:26 42:2 1.83:8 1.83:3
cage SIR Autospec-UltimaE ixt: AAP DBS 750.0,0.00%,F,F) Expt: OCDD		750.0,0.00%,F,F) Expt: OCDD	0 50.0,0.00%,F,F) Expt: OCDD	42:00	Expt: OCD	42:00 .00%,F,F) Expt: OCDD	A1:27 A1:16E4 A2:34E3 A2:34E3 A2:68E3 A3:78E3 A4:58E3
# 3 File Te 5,5,3,0.10%		A1:00 PKD(5,5,3,0.10%,750.0,	41:00 -3.0) PKD(5,5,3,0.10%,750.0,0	41,00	-3.0) PKD(5,5,3,0.10%,750.0,0.00%,F,F)	41:00 PKD(5,5,3,0.10%,750.0,0.00%,F,F)	40:37 40:54 M.04E3 A1:62E3
DBS CPSM / M23 CS3 BSUB(10000,15,-3.0)	Ab. (8Eb	BSUB(10000,15,-3.0) 39:52 A6.68E6	40:00 BSUB(10000,15,-3.0) 1 39:51 Al.,227	40:00	•	,-3.0)	3 AE 90E3 9:39 AE 90E3 03E3 MWWWWWWWWWW
Sample# 7 Text: 407.7818 S:7 F:4	60 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	409.7788 S:7 F:44 100% 80==================================	8253 S:7 F:4	ļ	419.8220 S:7 F:4 E 1008 80 60 40 20	7165 S:7 F:4	100k 80 80 39:29 40 40 20 03 03 03 03 03 03 03 03 03 0

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PCDD/PCDF CALIBRATION VERIFICATION

Alta Analytical Perspectives

Initial Calibration Date: 10/05/00

Instrument ID: MM-1

GC Column ID: DB-5

Date: 24 Fcb Ø

Reviewer:

VER Data Filename: 010223F1 S#1 Analysis Date: 23-FEB-01 Time: 11:17:52

NATIVE ANALYTES	M/Z'S FORMING RATIO	ION ABUND. RATIO	QC LIMITS	Pass	CONC. FOUND	CONC. RANGE (ng/mL)	
2,3,7,8-TCDD	M/M+2	0.79	0.65-0.89	۶,	5.81/	3.75 - 6.25	
1,2,3,7,8-PeCDD	M+2/M+4	1.58	1.32-1.78	>	27.34	18.75-31.25	
1,2,3,4,7,8-HXCDD 1,2,3,6,7,8-HXCDD 1,2,3,7,8,9-HXCDD	M+2/M+4 M+2/M+4 M+2/M+4	1.24 1.26 1.26	1.05-1.43 1.05-1.43 1.05-1.43	>> >> >>	26.17 26.81 26.29	18.75-31.25 18.75-31.25 18.75-31.25	
1,2,3,4,6,7,8-HpCDD M+2/M+4	M+2/M+4	1.03	0.88-1.20	٨	25.50	18.75-31.25	
осор	M+2/M+4	0.89	0.76-1.02	Y	53.07	37 - 65	
2,3,7,8-TCDF	M/M+2	0.75	0.65-0.89	X	4.88	3.75 - 6.25	
1,2,3,7,8-PeCDF 2,3,4,7,8-PeCDF	M+2/M+4 M+2/M+4	1.52	1.32-1.78	>>	24.99	18.75-31.25 18.75-31.25	
1,2,3,4,7,8-HXCDF	M+2/M+4	1.21	1.05-1.43	> :	24.01	18.75-31.25	
1,2,3,7,8,9-HXCDF	M+2/M+4 M+2/M+4	1.20	1.05-1.43	×	23.46	18.75-31.25 18.75-31.25 18.75-31.25	
1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF	M+2/M+4 M+2/M+4	1.02	0.88-1.20 0.88-1.20	× ×	23.60	18.75-31.25 18.75-31.25	
OCDF	M+2/M+4	0.87	0.76-1.02	۸	49.37	35 - 65	

Analyst: 616

Con De Follo	#44 PCDD/PCDF CALI PCDD/PCDF CALI Alta Analy Alta Analy GC Column ID: GC Column ID: M/Z'S ION RMING ABUND. RATIO RATIO H+2/M+4 1.57 M+2/M+4 1.57 M+2/M+4 1.57 M+2/M+4 1.05 M+2/M+4 1.05 M+2/M+4 1.05 M+2/M+4 1.05 M+2/M+4 1.05 M+2/M+4 1.05 M+2/M+4 1.05 M+2/M+4 1.05 M+2/M+4 1.05 M+2/M+4 1.05 M+2/M+4 1.05 M+2/M+4 0.90 M/M+2 0.90 M/M+2 0.90 M/M+2 0.90 M/M+2 0.90 M/M+2 0.90 M/M+2 0.90 M/M+2 0.90 M/M+2 0.90 M/M+2 0.90 M/M+2 0.90 M/M+2 0.90 M/M+2 0.90 M/M+2 0.90 M/M+2 0.90 M/M+2 0.90 M/M+2 0.90	Analy Analy O O	VERIFICATIO VERIFICATIO VERIFICATIO S 2 3 - FEB-0 Pass Pass Pass Y 9 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	IFICATION 23-FEB-01 Time: 11:17:52 CONC. RANG FOUND (ng/m) 94.77 70.0 96.17 70.0 96.17 70.0 96.17 70.0 96.17 70.0 97.00 96.17 70.0 96.17 70.0 96.17 70.0 96.17 70.0 97.00 96.17 70.0	CONC. RANGE (ng/mL) 70.0 - 130.0 70.0 - 130.0 70.0 - 130.0 70.0 - 130.0 70.0 - 130.0 70.0 - 130.0 70.0 - 130.0 70.0 - 130.0 70.0 - 130.0 70.0 - 130.0 70.0 - 130.0	Reviewer! G. Date: 24 FCD &	Page 8 of 8
DF XCDD XCDF -HpCDF	M+2/M+4 1.58 M+2/M+4 1.31 M/M+2 0.52 M/M+2 0.43	8 1.32-1.78 1 1.05-1.43 2 0.43-0.59 3 0.37-0.51	4 4 4 4	100.9			

Analyst: 646 Date: 24 Febol

75.0 - 125.0

70.96

0.43-0.59

0.53

M/M+2

13C-1,2,3,7,8,9-HxCDF

1,2,1,7,1,8,1,9,1,9,1,9,1,9,1,9,1,9,1,9,1,9,1,9	Clian	Juan 23-FEB-2001 17:44	44		Page	11		\	\					Γ
1,2,3,7,4=7000 1,394-71 1,3	تّ ز	thent ID: DBS CDBM / M2	3 CS3	E (llename:	010223	S	23-FEB-01	17152		Conce	,46550		- 1
1,2,17,16, Percon 1,2447 1,249 1,141 1,125 1,141				ಹ	Column	IDi db		M23_0*	-		Endcal:	010223P1 010223P1	ω	80
1,2,3,4,7,8=epec 1,39=epec 1,39=epec 1,39=epec 1,39=epec 1,30=epec		Nan 2.3.7.8		Resp	R.	,		ouc		8e Fa				
1,2,3,4,7,5,enkero 1,26 1,10		1,2,3,7,8-Pec	, -	199407				5.81		52 2	0.0			
1,2,3,7,6,2,=texton 1,2,2, 1,1,2		1,2,3,4,7,8-HXCI		000+00	1 24 5	٦.		27.3	S	1.4				
1,2,1,7,1,8-pcop 1,0,4+or 1,0,5		1,2,3,6,7,8-HXCI		23e+06	1.26 0			26.2	22	~				
1,2,3,4,6,7,8-HCDD 8.79e+66 1.03 y 1.13 4125 25.1 2240 2.5 0.126 Reviewer 1.23,37,8-TCD 1.23e+70 1.03 y 1.13 4125 25.1 25.0 0.238 1.23 0.126 1.23 0.126 1.23 0.126 1.23 0.126 1.23 0.13 0.13 0.13 0.13 0.13 0.13 0.13 0.1		1,2,3,7,8,9-HxCI		01e+07	1.26 4		2 5	26.8	22	~			(_
1,2,3,7,6=recor 1,58=r) 1,63		1,2,3,4,6,7,8-HpCD		79e+06	1.03 v	_	7 4	26.3	22	~	0	Revie		
1,2,3,7,8-TCDP 1,68e-00 0.75 y 1.05 26+45 4.89 21,23,7,6-TCDP 1,68e-00 0.75 y 1.05 26+45 4.89 21,23,7,6-TCDP 1,68e-00 1,59e-00 1,		900		23e+07	0.89 y	-	46	53.1	23	2	0			_
1,2,3,4,7,8,9,9ecroproperor 1,594 1,09 1,594		6						1	77	7	0			_
1,2,3,4,7,8=PeCDP 1,539+07 1,537 1,104 31137 25.0 6785 2.5 0.2253 1,2,3,4,7,8=PeCDP 1,539+07 1,123 1,113 36.12 24.0 1,133 2.5 0.0253 1,2,3,4,7,8=PeCDP 1,2,294 1,113 36.12 24.0 1,133 2.5 0.0264 1,2,3,4,6,7,8=PeCDP 1,2,294 1,124 3,115 36.12 24.0 1,133 2.5 0.0364 1,2,3,4,6,7,8=PeCDP 1,2,2,4,7,12,2 1,124 1,12		2,3,7,8-TCD		58e+06				8	7.4	r		Dater	5	
1,2,3,4,7,6=HRCDP 1,55=407 1,53 y 1,05 32,45 25,0 6785 25,0 2		1,2,3,/,8-PeCD		59e+07	1.52 y	_		5	4.4	4 6	90.0			
1,2,3,4,6,7,8=RKCDF 1,23e+70 1,121 1,13 36102 24.0 1782 25.00503 1,2,3,4,6,7,8=RKCDF 1,26e+70 1,129 1,115 3612 24.0 1783 25.00503 1,2,3,4,6,7,8=RKCDF 1,100e+70 1,129 1,116 3615 23.5 1783 25.00503 1,2,3,4,6,7,8=REDDF 1,000e+70 1,129 1,134 3014 22.4 1783 25.00503 1,2,3,4,6,7,8=REDDF 1,000e+70 1,129 1,134 3014 22.4 1783 25.00503 1,2,3,4,6,7,8=REDDF 1,000e+70 1,129 1,134 3014 22.4 1783 25.00503 1,2,3,4,6,7,8=READD 1,100e+70 1,129 1,134 4,134 3014 1,2,3,4,6,7,8=READD 1,100e+70 1,129 1,134 4,134 3013 1,2,3 1,134 1,13		1.2 3 4 7 9 m.cm		51e+07	1.53 y	_		5	70	4 0	2 0			
1.2, 3, 4, 5, 7, 8 - RECEP 1.29 4 1.24 36.11 24.3 31.10 24.3 11783 2.5 0.0453 1.2, 3, 4, 5, 7, 8 - RECEP 1.109 407 1.129 4 1.10 36.10 23.5 1.109 2.5 0.0453 1.2, 3, 4, 6, 7, 8 - RECEP 1.100 407 1.129 4 1.10 2.2 1.2 1.2 1.2 1.2 1.2 1.2 1.2 1.2 1.2		1 2 3 6 7 9 m.c.		2e+07		-		QUIT	7.	4 6	7.0			
1,2,3,7,8,9,8,EEPP 1,004-07 1,23 y 1,16 36,59 23.5 1783 25.0,0584 1,23,4,5,7,8,9,8,EEPP 1,004-07 1,23 y 1,54 39,47 23.5 1783 25.0,0584 1,23,4,5,7,8,9,8,EEPP 1,004-07 1,23 y 1,54 39,47 23.5 1783 25.0,0584 1,23,4,5,7,8,9,8,EEPP 1,004-07 1,02 y 1,54 39,47 23.6 23.1 1783 25.0,0952 1,0041 Penta-Dioxins 3,146+07 0,67 y 1,15 47,9 1,26 21,16 23.3 1,29 2.4 20,112 5.0,197 1,0041 Penta-Dioxins 3,146+07 1,25 y 1,10 30,13 72.8 1,208 2.5 0,130 1,0041 Penta-Dioxins 3,064-07 1,25 y 1,10 30,13 1,27 2.5 0,130 1,0041 Penta-Dioxins 3,064-07 1,25 y 1,10 30,13 1,20 2.5 1,20 2,2 1,20 2,2 1,20 2,2 1,20 2,2 1,20 2,2 1,20 2,2 1,20 2,2 1,20 2,2 1,20 2,2 1,20 2,2 1,20 2,2 1,20 2,2 1,20 2,2 1,2 1,2 1,2 1,2 1,2 1,2 1,2 1,2 1,2		23 4 6 7 9 HACD		19e+07	~			24.3	171	4 0	0.0			
1,2,3,4,5,7,8=Percell 1,000 1,02 1,13 1,1		1 2 2 7 9 9 HXCD		6e+07	-	-		23.5	171	, ,	0.0			
1,2,3,4,7,6,7,6,7,6,7,6,7,6,7,6,7,7,6,7,6,7,6		1.2 3 4 6 7 9 E.C.		06+07	~		37:51	23.5	121	, ,				_
Total Tetra-Dioxins 1.49e+70		1,2,3,4,6,7,8-HPCD		7e+07		-	39:47	23.6	100	, ,	0.05			_
Total Tetra-Dioxins 1.49e+0 0.87 y 1.15 47103 49.4 1292 2.5 0.147 Total Tetra-Dioxins 1.49e+0 0.77 y 1.26 2116 23.3 1252 2.5 0.0365 Total Tetra-Dioxins 1.49e+0 0.77 y 1.26 2116 23.3 1228 2.5 0.0365 Total Herac-Dioxins 1.6e+0 1.125 y 1.01 3519 82.7 2240 2.5 0.130 Total Herac-Dioxins 1.6e+0 1.125 y 1.01 3519 82.7 2240 2.5 0.130 Total Herac-Dioxins 1.34e+0 1.02 y 1.13 3519 82.7 2240 2.5 0.130 Total Penta-Furans 1.31e+0 1.64 y 1.05 2013 12.0 240 2.5 0.130 Total Herac-Purans 1.31e+0 1.64 y 1.05 2013 12.0 2013 Total Herac-Purans 1.31e+0 1.15 y 1.14 34139 98.3 1703 6785 2.5 0.257 Total Herac-Purans 5.17e+0 1.12 y 1.13 2713 91.5 2013 2.5 0.0870 13G-12,3,7,8-PeDD 5.08e+0 1.05 y 0.93 33106 94.7 2013 2.5 0.0870 13G-12,3,4,6,7,8-HEDD 5.08e+0 1.05 y 0.93 33106 94.7 2013 2.5 0.0870 13G-12,3,4,6,7,8-HEDD 5.08e+0 1.05 y 0.93 33106 94.7 2013 2.5 0.0870 13G-12,3,4,6,7,8-HEDD 5.08e+0 1.05 y 0.90 39146 87.2 2010 2.13 1.00 2.13 1.		000		8e+06		-	2:1	22.4	100	, ,				_
Total Tetra-Dioxins 1.49e+07 0.77 y 1.26 21116 23.3 1252 2.5 0.0365 Total Tetra-Dioxins 3.16e+07 1.56 y 1.01 30133 72.8 120888 2.5 7.34 Total Tetra-Dioxins 3.16e+07 1.56 y 1.01 3519 82.7 2240 2.5 0.130 Total Tetra-Dioxins 1.36e+07 1.02 y 1.01 3519 82.7 2240 2.5 0.130 Total Hexa-Dioxins 1.36e+07 1.02 y 1.03 2113 12.0 29.5 2013 12.0 29.1 2.5 0.102 Total Tetra-Purans 9.06e+06 0.84 y 1.05 20145 20.5 20.5 20.5 20.5 20.5 20.5 20.5 20.			1	/n+ar		-	7:0	6	129	2	0.14			_
Total Heater-Dioxins 3.16e+07 1.156 7 1.10 3513 72.8 120888 2.5 0.136 Total Heater-Dioxins 3.06e+07 1.25 7 1.10 3513 72.8 120888 2.5 0.136 Total Heater-Dioxins 1.06e+07 1.25 7 1.10 3519 82.7 2240 2.5 0.136 Total Heater-Dioxins 1.06e+07 1.02 7 1.13 40113 47.6 2342 2.5 0.136 184 Fno. Pentar-Furans 9.06e+06 0.84 7 1.05 20113 12.0 2015 2241 2.5 0.0638 Total Penta-Furans 1.31e+07 1.64 7 1.05 20113 12.0 2015 2281 2.5 0.137 2013 12.0 2015 2281 2.5 0.137 2013 12.0 2015 2281 2.5 0.137 2013 12.0 2015 2281 2.5 0.137 2013 2015 2015 2015 2015 2015 2015 2015 2015		Total Tetra-Dioxing	1	96+07	77	1 36		•				EMDC		_
Total Hexta-Dioxins 3.06e+07 1.25 7 1.10 35119 82.7 1240 2.5 0.130 Total Tetza-Purans 1.64e+07 1.02 7 1.13 40113 47.6 2340 2.5 0.130 Ist For Penta-Furans 9.06e+06 0.64 7 1.05 20113 12.0 2240 2.5 0.130 Ist For Penta-Furans 1.31e+07 1.64 7 1.05 28145 20.5 2688 2.5 0.130 Total Hepta-Furans 1.31e+07 1.64 7 1.05 28145 20.5 2688 2.5 0.130 Total Hesta-Furans 1.31e+07 1.64 7 1.05 28145 20.5 20.63 24812 2.5 0.0638 Total Hesta-Furans 1.31e+07 1.13 7 1.14 34139 98.3 1788 2.5 0.257 Total Hesta-Furans 5.17e+07 1.13 7 1.14 34139 98.3 1788 2.5 0.0508 13C-1,2,3,7,8-PecDp 4.29e+07 1.20 7 0.93 3707 96.1 20.5 172 2.5 0.0870 13C-1,2,3,6,7,8-HECDD 2.26e+07 1.05 7 0.91 4124 89.9 1.5 13C-1,2,3,6,7,8-HECDD 2.26e+07 0.90 7 0.73 4.642 80.3 1.00 80.1 1.20 90.9 1.00 1.00 1.00 1.00 1.00 1.00 1.0		Total Penta-Dioxing	m	6e+07		1.20	<u> </u>	23.3		7	0.0365	23.5		_
Total Hepta-Dioxina 1.66e+7 1.02 7 1.13 40113 47.6		Total Hexa-Dioxing		5e+07		10	25.10	8.7/	\sim	8 2.	7.34	73.1		_
Second Pertal Pertal Second Secon		Total Hepta-Dioxing		1e+07		1.13	40.13	82.7	224	2.	0.130	83.2		
Second Second		Total Tetra-Furans		Se+06		10.1	20.13	47.6	239	2.	0.193	48.2		_
Total Penta-Fuzans 4.49e+07 1.52 y 1.05 3137 70.3 2667 2.5 0.102 Total Herta-Fuzans 4.49e+07 1.52 y 1.05 3137 70.3 6785 2.5 0.102 Total Herta-Fuzans 1.95e+07 1.02 y 1.14 34139 90.8 1783 2.5 0.0870 Total Herta-Fuzans 1.95e+07 1.02 y 1.14 34139 90.8 1783 2.5 0.0870 13C-1,2,3,7,8-PCDD 5.08e+07 0.80 y/ 1.13 27437 91.5 2071 2.5 0.0870 13C-1,2,3,7,8-PCDD 3.06e+07 0.80 y/ 1.00 96.1 40.24 89.9 13C-1,2,3,7,8-PCDD 3.06e+07 0.90 y/ 4642 80.3 37107 96.1 13C-1,2,3,7,8-PCDD 2.26e+07 0.90 y/ 7 0.95 3116 84.6 10.0 96.1 13C-1,2,3,7,8-PCDD 6.11e+07 0.90 y/ 0.96 3116 84.6 10.0 96.1 13C-1,2,3,4,6-PCDD 6.11e+07 0.80 y/ 0.90 3116 84.6 10.0 96.1 13C-1,2,3,4-PCDD 7.5e+07 0.81 y/ 0.90 3116 81.8 108 13C-1,2,3,4-PCDD 7.8e+07 0.81 y/ 0.00 25:20 100 10.1 13C-1,2,3,4-PCDD 7.5e+07 0.81 y/ 0.91 3116 81.8 108 13C-1,2,3,4,7,8-PCDD 7.8e+07 0.81 y/ 0.97 3144 105 13C-1,2,3,4,7,8-PCDD 3.9e+07 0.81 y/ 0.93 37100 10.1 13C-1,2,3,4,7,8-PCDD 3.9e+07 0.82 y/ 0.93 37100 10.1 13C-1,2,3,4,7,8-PCDD 7.8e+07 0.82 y/ 0.93 37100 10.1 13C-1,2,3,4,7,8-PCDD 7.8e+07 0.82 y/ 0.93 37100 10.1 13C-1,2,3,4,7,8-PCDD 7.8e+07 0.82 y/ 0.93 37100 10.1 13C-1,2,3,4,7,8-PCDD 7.8e+07 0.82 y/ 0.93 37100 10.1 13C-1,2,3,4,7,8-PCDD 7.8e+07 0.82 y/ 0.93 37100 10.1 13C-1,2,3,4,7,8-PCDD 7.8e+07 0.82 y/ 0.82 4213 96.1 100 10.1 13C-1,2,3,4,7,8-PCDD 7.8e+07 0.82 y/ 0.82 4213 96.1 100 10.1 13C-1,2,3,4,7,8-PCDD 7.8e+07 0.82 y/ 0.82 4213 96.1 100 10.1 13C-1,2,3,4,7,8-PCDD 7.8e+07 0.82 y/ 0.82 4213 96.1 100 10.1 13C-1,2,3,4,7,8-PCDD 7.8e+07 0.83 y/ 0.85 4213 96.1 100 10.1 13C-1,2,3,4,7,8-PCDD 7.8e+07 0.83 y/ 0.85 4213 96.1 100 10.1 10.1 10.1 10.1 10.1 10.1 10				1e+07		1.05	28.45	30.5	242	7	0.0638	12.5		
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Tocal Hexa-Furans 5.17e+07 1.19 y 1.14 34;39 98.3 Total Hepta-Furans 1.95e+07 1.02 y 1.42 39;47 46.3 Total Hepta-Furans 1.95e+07 1.02 y 1.42 39;47 46.3 13C-1,2,3,7,8-TCDD 5.08e+07 0.80 y 1.13 27;37 91.5 13C-1,2,3,6,7,8-HECDD 3.36e+07 1.20 y 0.93 33;06 94.7 13C-1,2,3,4,6,7,8-HECDD 3.05e+07 1.20 y 0.93 33;06 96.1 13C-1,2,3,7,8-TCDF 7.20e+07 0.90 y 0.73 46;42 82.3 13C-1,2,3,7,8-TCDF 7.20e+07 0.90 y 0.96 31;36 84.6 13C-1,2,3,6,7,8-HECDF 6.11e+07 0.80 y 1.06 26;43 90.0 13C-1,2,3,6,7,8-HECDF 6.11e+07 0.81 y 0.90 39;46 87.2 13C-1,2,3,4,6,7,8-HECDF 7.99 0.90 39;46 87.2 13C-1,2,3,4,6,7,8-HECDF 7.99 0.90 39;46 87.2 13C-1,2,3,4,6,7,8-HECDF 7.99 0.90 39;46 87.2 13C-1,2,3,4,6,7,8-HECDF 7.99 0.90 39;46 87.2 13C-1,2,3,4,6,7,8-HECDF 7.99 0.90 39;46 87.2 13C-1,2,3,4,6,7,8-HECDF 7.99 0.91 y 1.00 26;57 100 13C-1,2,3,4,7,8-HECDF 7.98 0.91 37;46 105 13C-1,2,3,4,7,8-HECDF 7.98 0.91 37;46 105 13C-1,2,3,4,7,8-HECDF 7.98 0.91 36;02 102 13C-1,2,3,4,7,8-HECDF 7.98 0.91 36;02 102 13C-1,2,3,4,7,8-HECDF 7.98 0.91 36;01 96:0		PecDF Totals	••		•			0 0	8/9	7	. 25			
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13C-1,2,3,7,8-PECDF 6.11e+07 1.58 y/ 0.96 26143 90.0 13C-1,2,3,7,8-PECDF 6.11e+07 1.58 y/ 0.96 31:36 84.6 13C-1,2,3,4,7,8-PECDF 7.20e+07 0.79 y 1.06 26143 90.0 13C-1,2,3,4,7,8-PECDF 7.5e+07 0.52 y 1.28 36:10 96.1 13C-1,2,3,4-7,8-PECDF 2.95e+07 0.81 y/ 0.91 39:46 87.2 13C-1,2,3,4-7,8-PECDF 7.54e+07 0.81 y/ 1.00 26:57 100 13C-1,2,3,4-7,8-PECDF 7.54e+07 0.77 y 1.00 26:57 100 37C1-2,3,7,8-PECDF 6.24e+07 1.26 y/ 1.00 37:26 100 13C-1,2,3,4,7,8-PECDF 6.24e+07 1.58 y/ 0.97 32:44 105 13C-1,2,3,4,7,8-PECDF 7.54e+07 0.53 y/ 0.91 36:02 102 13C-1,2,3,4,7,8-PECDF 7.54e+07 0.53 y/ 0.91 36:02 102 13C-1,2,3,4,7,8-PECDF 7.54e+07 0.53 y/ 0.91 36:02 102 13C-1,2,3,4,7,8-PECDF 7.5e+07 0.53 y/ 1.07 37:50 96:0	•	130 Oct	3.05		>	0.91	41:24	89.9				96.1		
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13C-1,2,3,4-TCDD 4.89e+07 0.81 y 1.00 26:57 100 13C-1,2,3,7,8,9-HXCDD 3.75e+07 0.77 y 1.00 25:20 100 37C1-2,3,7,8-TCDD 2.82e+07 1.26 y 1.00 37:26 100 37C1-2,3,7,8-PCDD 2.82e+07 0.51 27:38 108 13C-2,3,4,7,8-PCDF 6.24e+07 1.58 y 0.97 32:44 105 13C-1,2,3,4,7,8-HXCDD 3.13e+07 1.31 y 0.92 37:00 101 3C-1,2,3,4,7,8-HXCDF 2.42e+07 0.53 y 0.91 36:02 102 3C-1,2,3,4,7,8,9-HXCDF 2.42e+07 0.43 y 0.85 42:13 96:1		13C-0CDF	7			æ	7	81.8				87.2		
13C-1,2,3,4-TCDF 7.54e+07 0.77 y 1.00 26:57 100 13C-1,2,3,7,8,9-HXCDD 3.75e+07 1.26 y 0.51 27:38 108 13C-2,3,4,7,8-FECDF 6.24e+07 1.58 y 0.97 32:44 105 13C-2,3,4,7,8-HXCDD 3.13e+07 1.31 y 0.92 37:00 101 13C-1,2,3,4,7,8-HXCDF 4.30e+07 0.52 y 0.91 36:02 102 3C-1,2,3,4,7,8,9-HPCDF 2.42e+07 0.53 y 0.85 42:13 96:1 13C-1,2,3,7,8,9-HXCDF 3.85e+07 0.53 y 1.07 37:50 96:0	Ę	13C-1.2.3.4-monn				4						81.8		
13C-1,2,3,7,8,9-HxCDD 3.75e+07 1.26 \(\begin{array}{c} \begin{array}{c} 37c1-2,3,7,8-TCDD 2.82e+07 \end{array} \) 0.51 \(27i38 \end{array} \) 100 37C1-2,3,7,8-TCDD 2.82e+07 1.58 \(\begin{array}{c} y & 0.57 & 27i38 & 108 \end{array} \) 13C-2,3,4,7,8-HxCDD 3.13e+07 1.31 \(y & 0.92 & 37i00 & 101 \end{array} \) 13C-1,2,3,4,7,8-HxCDF 4.30e+07 0.52 \(y & 0.91 & 36i02 & 102 \end{array} \) 36-1,2,3,4,7,8,9-HxCDF 2.42e+07 0.43 \(y & 0.85 & 42i13 & 96:1 \end{array} \) 96.1		13C-1.2.3.4-#CDF				1.00	26:57	100						
2.82e+07	Ę	13C-1,2,3,7,8,9-HxCDD				1.00	25120	100				' '		
2.82e+07						7.00	3/126	100					•	_
6.24e+07 1.58 y 0.97 32:44 105 3.13e+07 1.31 y 0.92 37:00 101 4.30e+07 0.52 y 0.91 36:02 102 2.42e+07 0.43 y 0.85 42:13 96.1 3.85e+07 0.53 y 1.07 37:50 96.0		37C1-2,3,7,8-TCDD				.51	27,38	108				Analyst	040	
3.13e+07 1.31 y 0.92 37:00 101 4.30e+07 0.52 y 0.91 36:02 102 2.42e+07 0.43 y 0.85 42:13 96.1 3.85e+07 0.53 y 1.07 37:50 96.0		13C-1,3,4,/,8-PecDF			58 y/	.97	32:44	105				108/		
4.30e+0/ 0.52 y' 0.91 36:02 102 2.42e+07 0.43 y' 0.85 42:13 96.1 3.85e+07 0.53 y' 1.07 37:50 96.0		13C-1,2,3,4,7,8-HXCDD			.31 y	.92	37:00	101				105/	100/05/	
3.85e+07 0.53 y 1.07 37:50 96.0	13	C-1,2,3,4,7,8,9-HPCDF	4.30e		.52 y	.91	36:02	102				101 Cate: 0	いかめり	
6 0.55 1.50 96.0		13C-1,2,3,7,8,9-HxCDF	3.856			.85	42:13	96.1				717		
				•			06176	96.0				/0.96		

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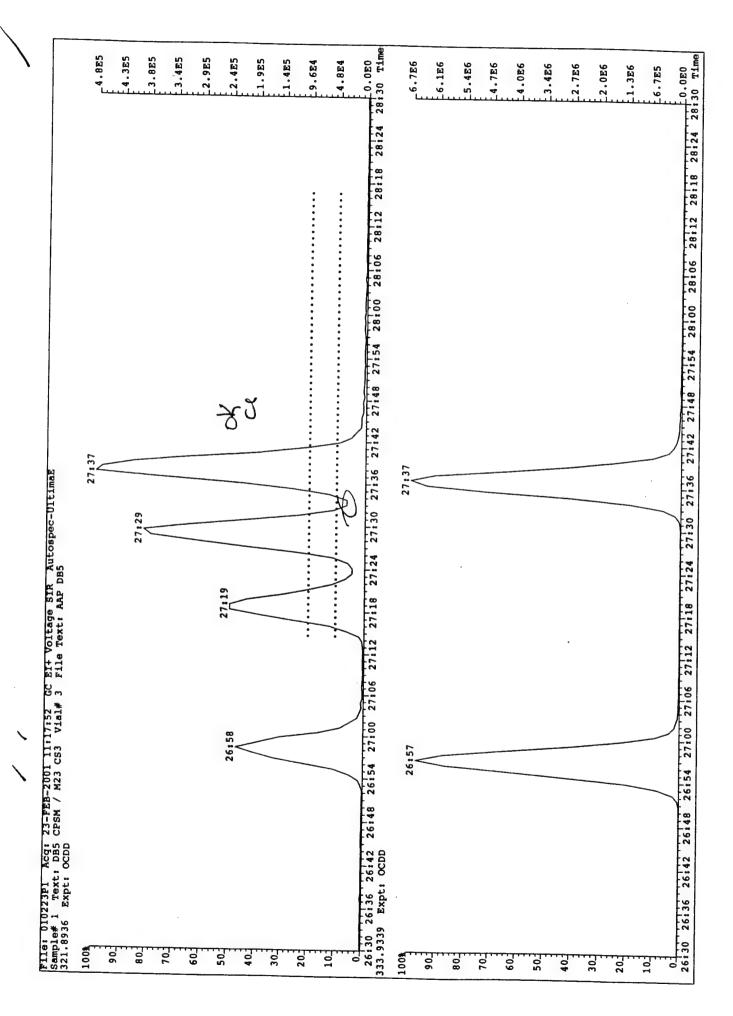
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OPUSquan 23-FEB-2001	-2001 17:50	Page	e 1			
						Page 10 of 10
	PCDD/PCDF RT WIN	FO VDOW AND ISOM	FORM 5 PCDD/PCDF RT WINDOW AND ISOMER SPECIFICITY STANDARDS			
Lab Name	Lab Name: Alta Analytical Perspectives Episode No.:	Perspectives	Episode No. :			
Contract No.	No. 1	SAS No.1			3	
Instrume	Instrument ID: MM-1	Initial	Calibration Date: 10/5/00		Reviewer	
RT Windo	RT Window Data Filename: 010223P1 S#1	110223P1 S#1	Analysis Date: 23-FEB-01	23-FEB-01 Time: 11:17:52	Date: 24 146 Ø 1	
DB-5 IS	DB-5 IS Data Filename: 010223P1)223P1 S#1	Analysis Date: 23-FEB-01	Time: 11:17:52		
DB_225 I	DB_225 IS Data Filename:		Analysis Date:	Time:		
	DB-5	DB-5 RT WINDOW D	DEFINING STANDARDS RESULTS			
ISOMERS 1,3,6,8	ISOMERS 1,3,6,8-TCDD (F) 1,2,8,9-TCDD (L)	ABSOLUTE RT 23:52 28:38	ISOMERS 1,3,6,8-TCDF (F) 1,2,8,9-TCDF (L)	ABSOLUTE RT 21:41		
1,2,4,7	1,2,4,7,9-PeCDD (F) 1,2,3,8,9-PeCDD (L)	30:33	1,3,4,6,8-PeCDF (F) 1,2,3,8,9-PeCDF (L)	28:45		
1,2,4,6	1,2,4,6,7,9-HxCDD (F) 1,2,3,7,8,9-HxCDD (L)	35:19	1,2,3,4,6,8-HxCDF (F) 1,2,3,7,8,9-HxCDF (L)	34:39		
1,2,3,4	1,2,3,4,6,7,9-HpCDD (F) 1,2,3,4,6,7,8-HpCDD (L)	40:13	1,2,3,4,6,7,8-HpCDF (F) 1,2,3,4,7,8,9-HpCDF (L)	39:47		
(F) = F1	 First eluting isomer 	(DB-5); (L)	- Last eluting isomer (DB-5)	-5).		
机酸铂 朴社 红 拉拉 医角状 化铁铁铁 內	ISOMER SPECIFICITY		(IS) TEST STANDARD RESULTS	11 11 11 11 11 11 11 11 11 11 11 11 11		
	\$ VALLEY HEIGHT BETWEEN COMPARED PEAKS (1)	(GHT)				
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<u> </u>						•
					Analyst:	
					Date:	



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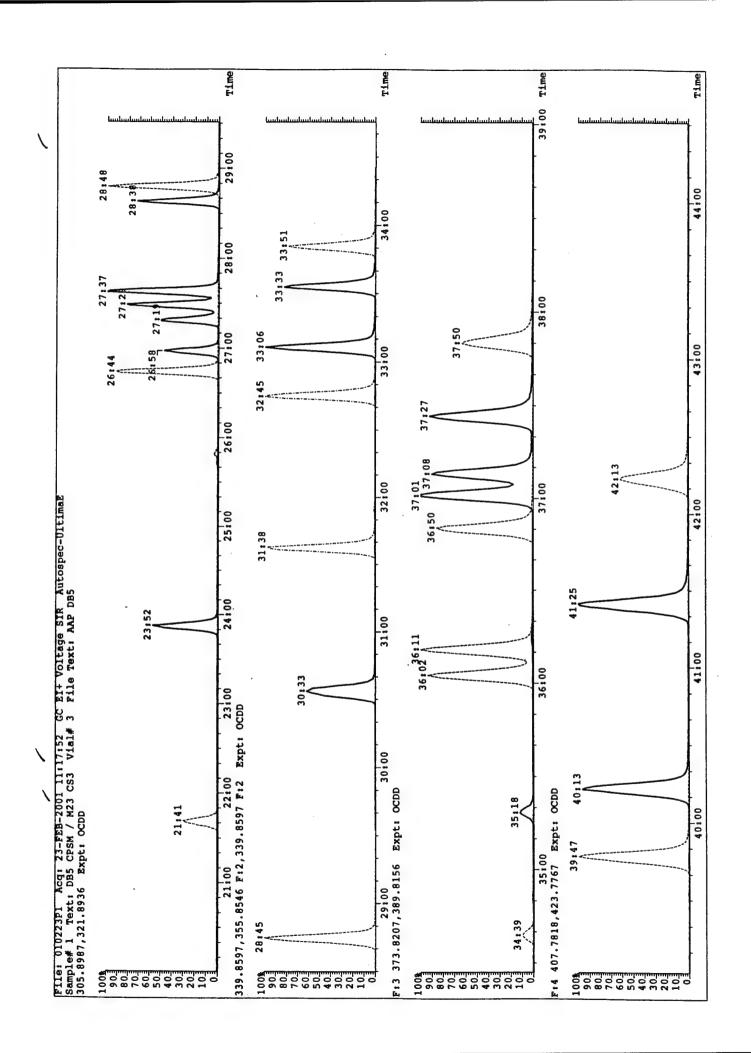
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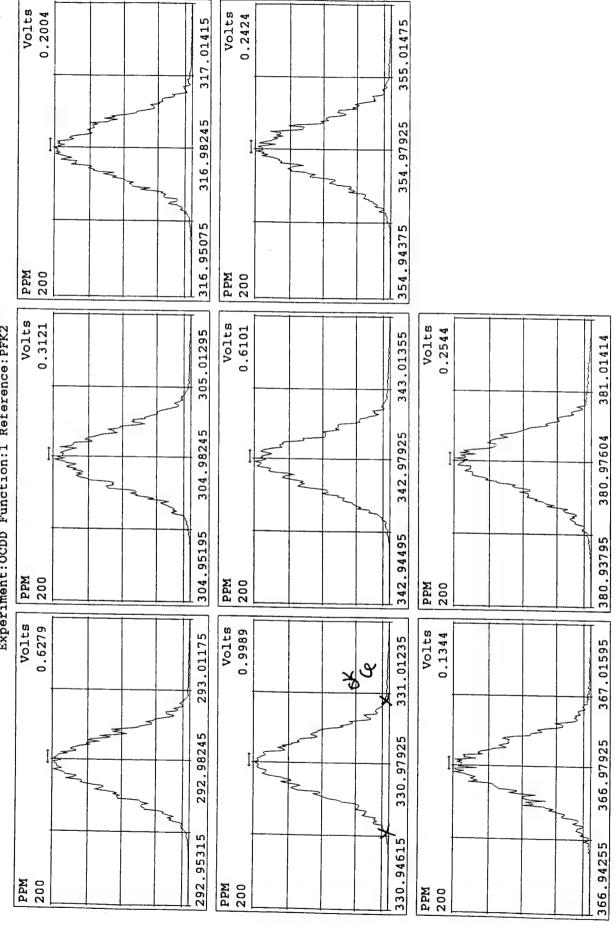
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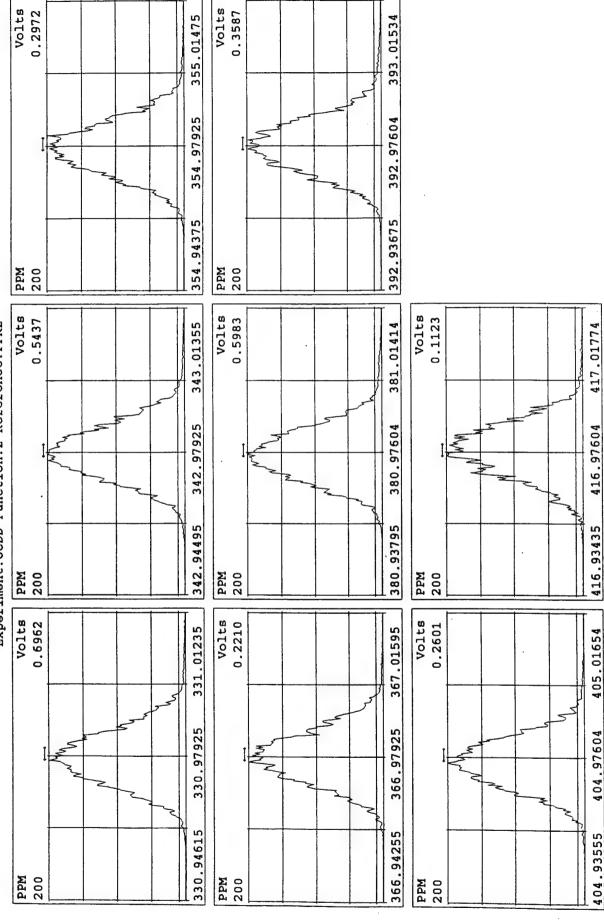
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Peak Locate Examination: 23-FEB-2001:11:15 File: 010223P1 Experiment: OCDD Function: 1 Reference: PFK2



Peak Locate Examination:23-FEB-2001:11:16 File:010223P1 Experiment:0CDD Function:2 Reference:PFK2



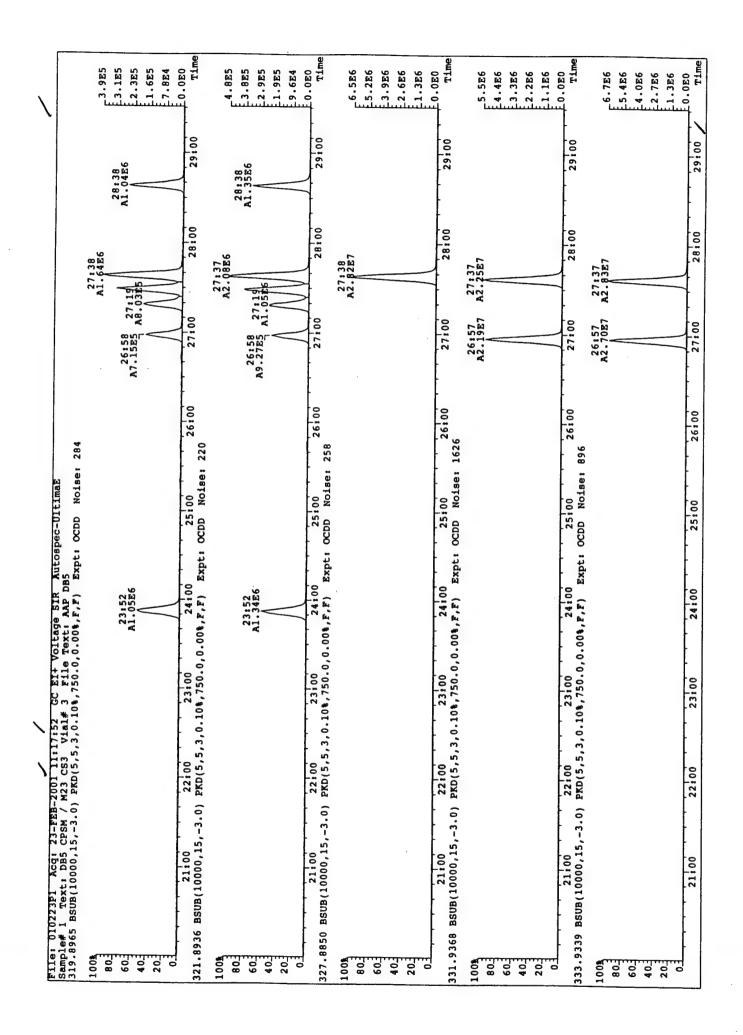
Volts Volts 0.3829 393.01534 431,01594 392.97604 430.97284 392,93675 430.92974 PPM 200 PPM 200 Peak Locate Examination:23-FEB-2001:11:16 File:010223P1 Volts 0.5282 Volts Volts 0.2428 Experiment: OCDD Function: 3 Reference: PFK2 0.1952 381.01414 417.01774 455.01834 380.97604 416.97604 454.97284 380,93795 416.93435 454.92734 PPM 200 PPM 200 PPM 200 Volts Volts Volts 0.2617 367,01595 405.01654 443.01714 366.97925 404.97604 442.97284 366.94255 404.93555 442.92854 PPM 200 PPM 200 PPM 200

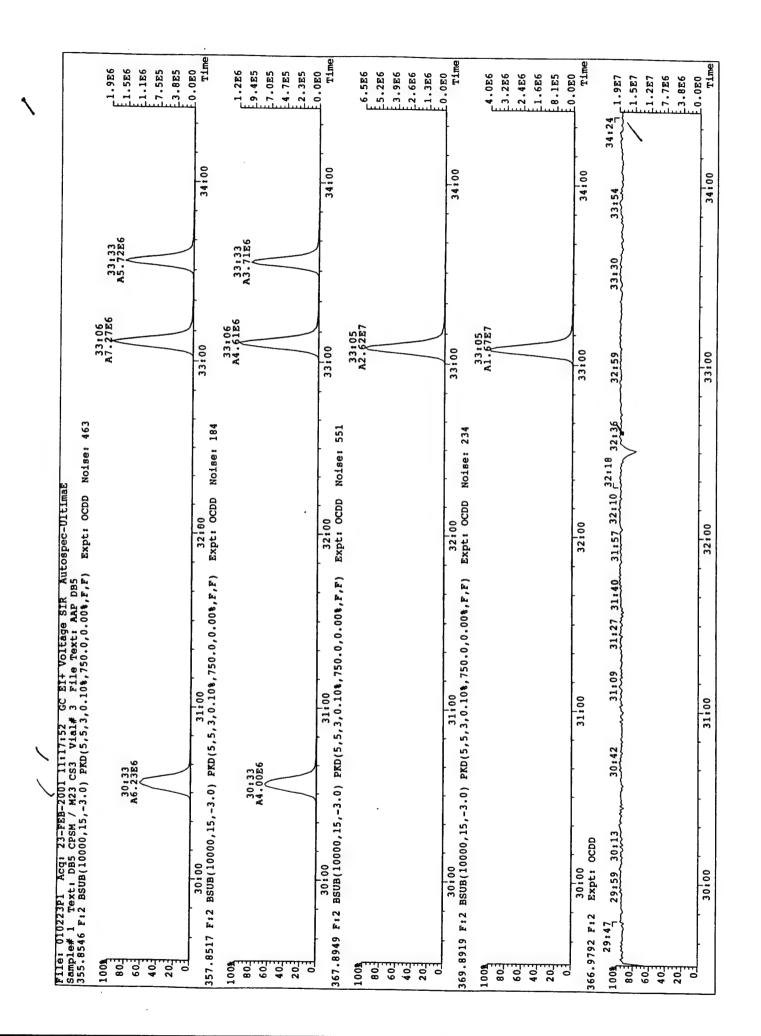
Volts 0.3630 Volts 0.1609 431.01594 467.01954 430.97284 466.97284 466.92614 430.92974 PPM 200 PPM 200 Volts Volts 0.3527 Experiment: OCDD Function: 4 Reference: PFK2 417.01774 455.01834 416.97604 454.97284 416.93435 454.92734 PPM 200 PPM 200 Volts Volts Volts 0.1994 405.01654 443.01714 481.01776 404.97604 442.97284 480.96967 404.93555 442.92854 480.92157 PPM 200 PPM 200 PPM 200

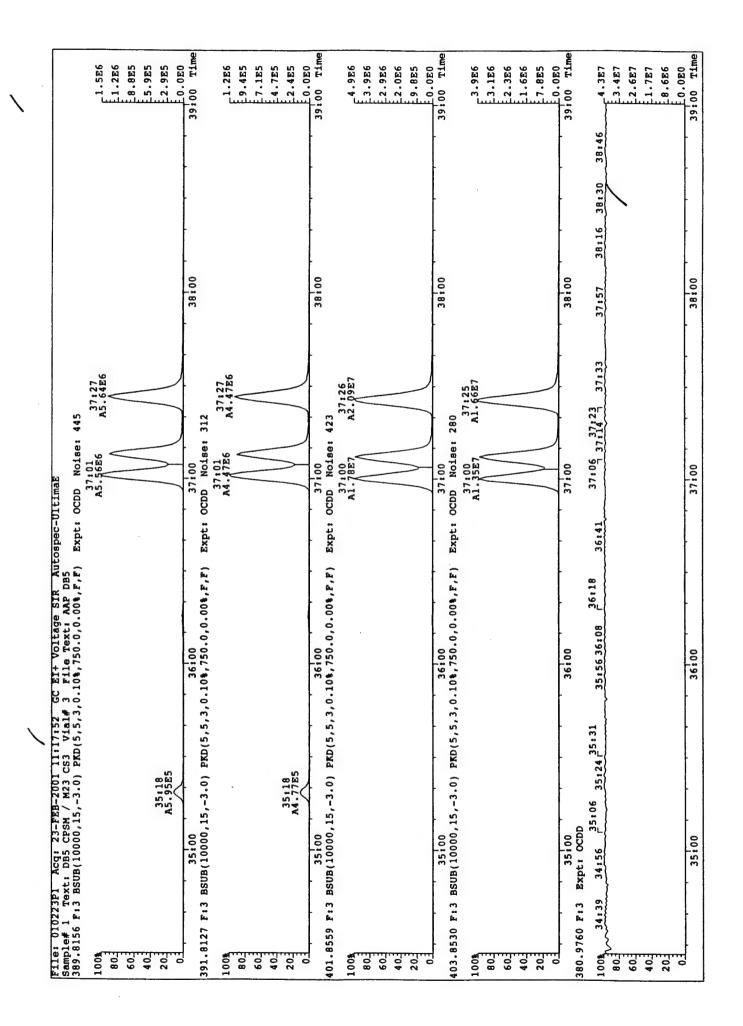
Peak Locate Examination: 23-FEB-2001:11:16 File: 010223P1

Volts Volts 0.2366 0.3281 455.01834 493.01896 454.97284 492.96967 454.92734 492.92037 PPM 200 PPM 200 Peak Locate Examination:23-FEB-2001:11:17 File:010223P1 Volts 0.2686 Volts Experiment: OCDD Function: 5 Reference: PFK2 Volts 0.1522 443.01714 481.01776 517.02136 442.97284 480.96967 516.96967 442.92854 480.92157 516.91797 PPM 200 PPM 200 PPM 200 Volts Volts 0.1587 Volts 0.2535 431,01594 467.01954 505.02016 430.97284 466.97284 504.96967 430.92974 466.92614 504.91917 PPM 200 PPM 200 PPM 200

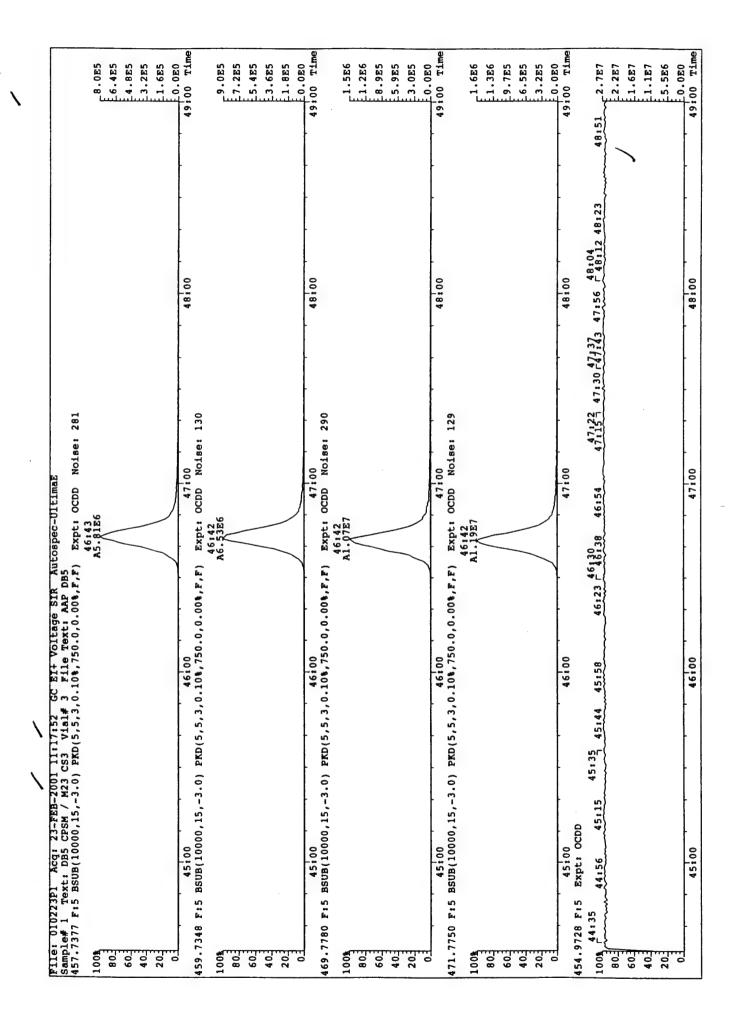
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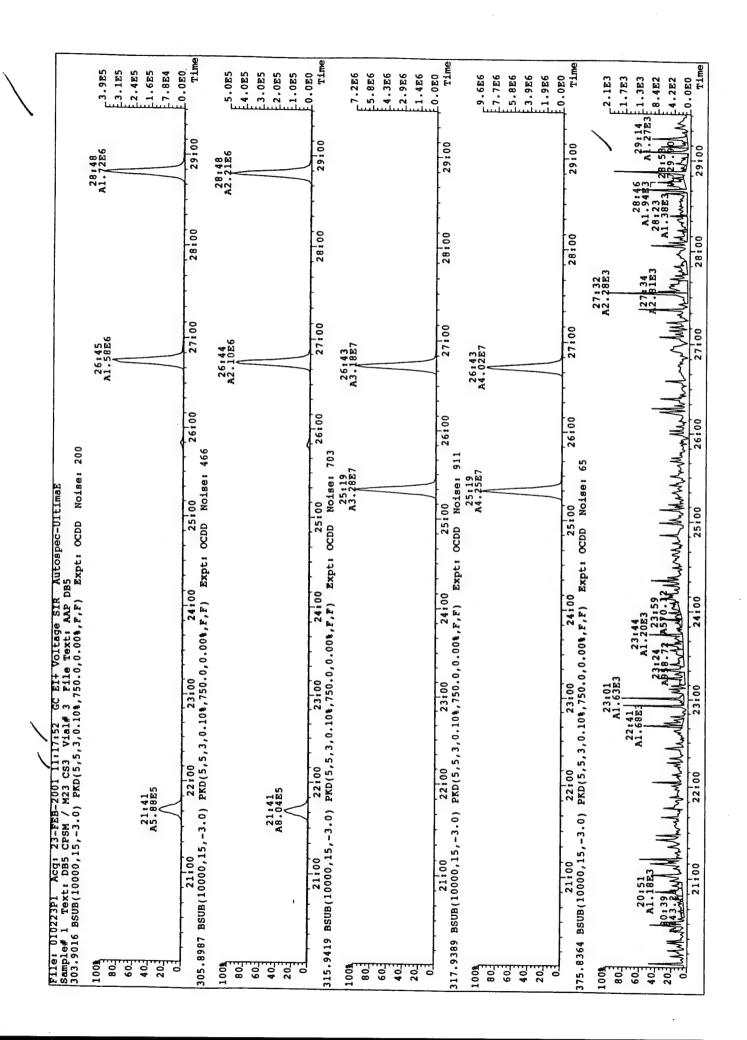


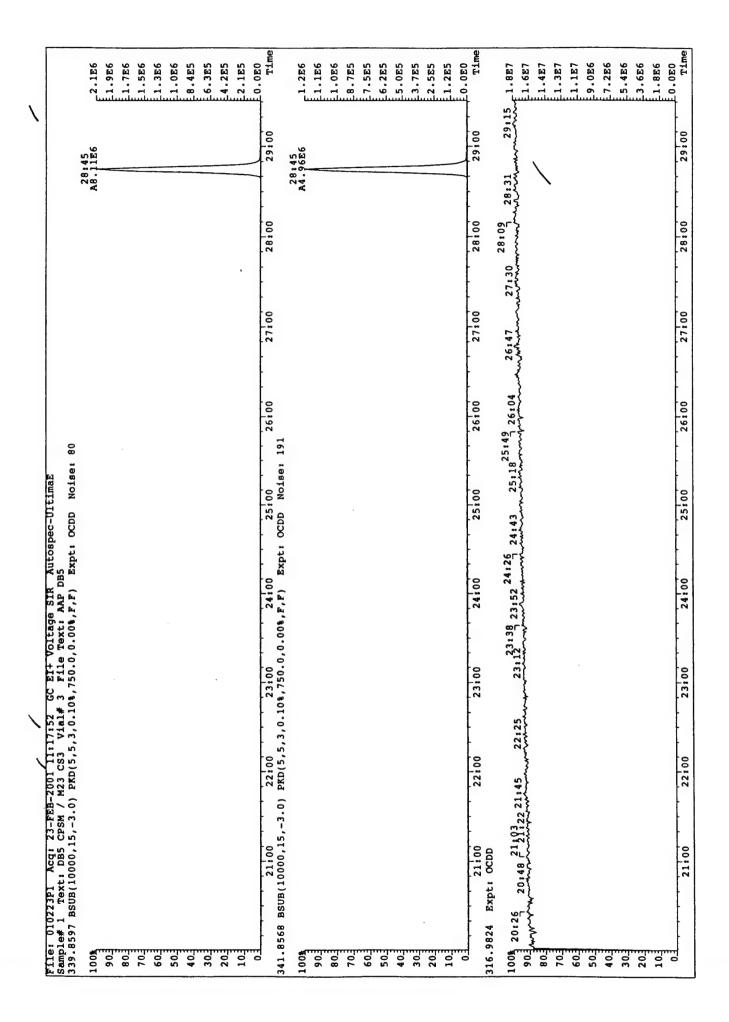


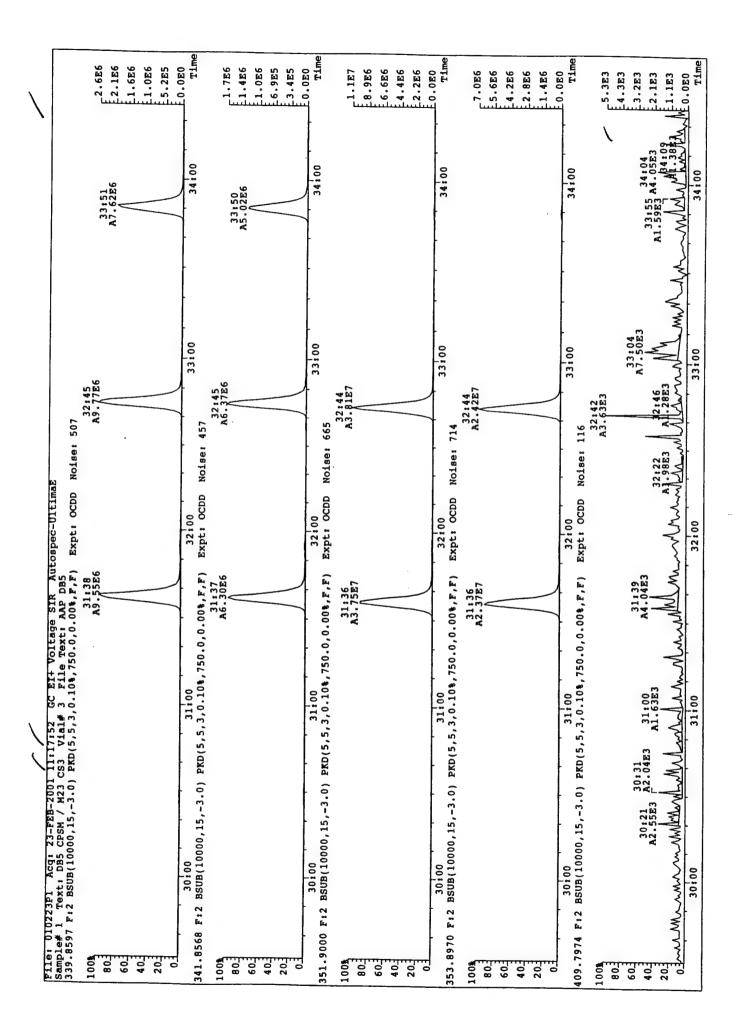


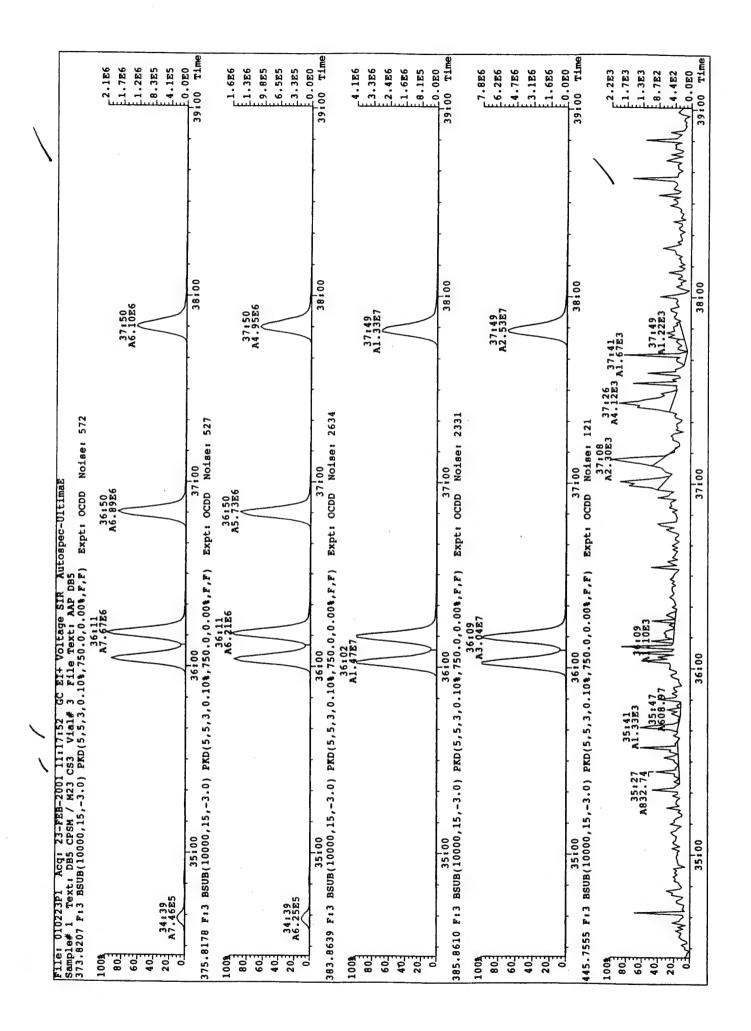
P. 18. (11777B) N.C. 37 BER 1177 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			
1e# 1 Text: DB5 CPSM / M23 CS3 Vial# 3 File Text: 7767 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,750.0,0.0			
100s A3.82E6 A4.46E6			8.1E5
40			4.855
203			1.625
41:00	43:00	44:00	Time
40:13 A3.74E6 A4.33E6			7.9E5
09			6.385
201			3.255
42:00	43:00	44:00	E0.0E0
33.64.07 F' BSUB(10000,12,-3.0) PKD(5,5,3,0.10%,750.0,0.00%,F,F) Expt: OCDD Noise: 1140 41:23 A1:56E7			0 0 0
609			2.386
20			1.256
42:00 437.8140 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,750.0,0.00%,F,F) Expt: OCDD Noise: 586	43:00	44:00	£0.0E0
100% 41:23 804 804			2.7E6
60-			1.6E6
07			5.585
430.9728 F:4 Expt: OCDD 42:00 41:00 42:00	43:00	44:00	Time
39:05 39:24 39:48 40:10 40:22 40:40 40:56 41:21 41:30 41:50 42:15 42:24	42:43 43:06 43:19 43:37	37 43:48 37 7 44:00 44:18	2.757
			E2.2E7
202			5.486
40:00 41:00 42:00	43:00	44:00	LO.OEO Time

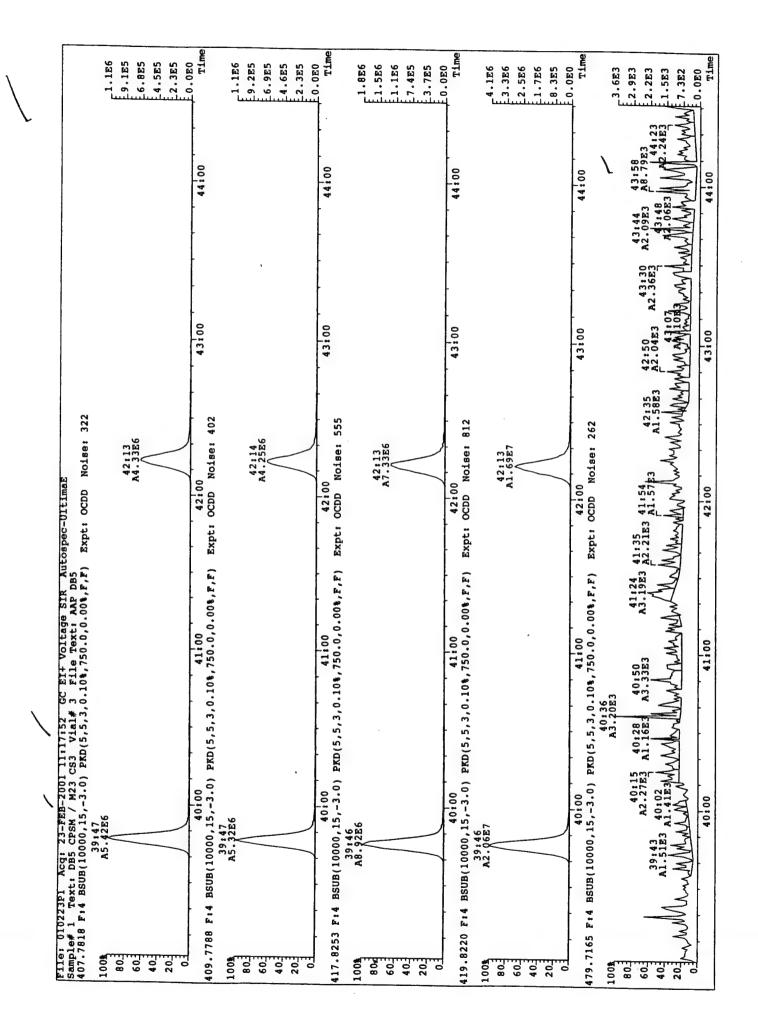


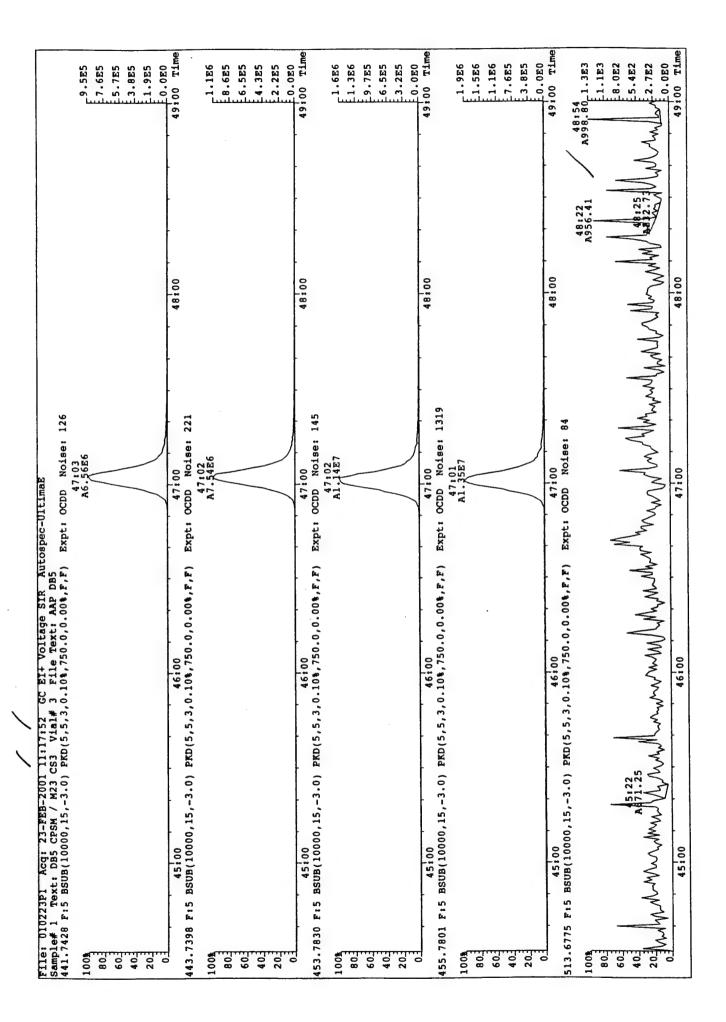












OPUSquan 23-FEB-2001	001 17:53		Page 1					Γ
	PCI	OD/PCDF C	PCDD/PCDF CALIBRATION VERIFICATION	VERIFICATI	NO		Page 10 of 1	10
		Alta An	Alta Analytical Pe	Perspectives				
Initial Calibrat	Calibration Date: 10/05/00	/02/00					Reviewer:	
Instrument ID: MM-1		GC Column ID: DB-5	ID: DB-5				24 62 67	·.
VER Data Filename: 010223P1	e: 010223P1	S#4 A	Analysis Dat	ate: 23-FEB-0] Time: 13:52:50	1 Time: 1	3:52:50	1	
NATIVE ANALYTES	M/Z'S FORMING RATIO	ION ABUND. RATIO	QC LIMITS	2000	CONC. FOUND	CONC. RANGE (ng/ml)		7,
2,3,7,8-TCDD	M/M+2	0.77	0.65-0.89	>-	5.72	3.75 - 6.25		
1,2,3,7,8-PeCDD	M+2/M+4	1.56	1.32-1.78	٨	27.30	18.75-31.25		
1,2,3,4,7,8-HxCDD 1,2,3,6,7,8-HxCDD 1,2,3,7,8,9-HxCDD	M+2/M+4 M+2/M+4 M+2/M+4	1.25 1.26 1.24	1.05-1.43 1.05-1.43 1.05-1.43	>> >> >>	25.77 26.57 26.94	18.75-31.25 18.75-31.25 18.75-31.25		·····
1,2,3,4,6,7,8-HpCDD M+2/M+4	M+2/M+4	1.03	0.88-1.20	۶.	25.37	18.75-31.25		
	M+2/M+4	0.88	0.76-1.02	٨	52.15	37 - 65		
2,3,7,8-TCDF	M/M+2	0.74	0.65-0.89	>	4.75	3.75 - 6.25		
1,2,3,7,8-PeCDF 2,3,4,7,8-PeCDF	M+2/M+4 M+2/M+4	1.54	1.32-1.78	» »	25.15	18.75-31.25 18.75-31.25		
1,2,3,4,7,8-HxCDF 1,2,3,6,7,8-HxCDF 2,3,4,6,7,8-HxCDF 1,2,3,7,8,9-HxCDF	M+2/M+4 M+2/M+4 M+2/M+4 M+2/M+4	1.23 1.22 1.22 1.22	1.05-1.43 1.05-1.43 1.05-1.43 1.05-1.43	***	24.69 24.52 24.09	18.75-31.25 18.75-31.25 18.75-31.25 18.75-31.25		
1,2,3,4,6,7,8-HpCDF 1,2,3,4,7;8,9-HpCDF	M+2/M+4 M+2/M+4	1.02	0.88-1.20 0.88-1.20	> >	24.26	18.75-31.25 18.75-31.25		
	M+2/M+4	0.89	0.76-1.02	γ	49.06 /	35 - 65		
							Analyst: 646	_
							Date: 23 FC6 D(

Page 1 23-FEB-2001 17:53 OPUSquan

Page 10 of 10

PCDD/PCDF CALIBRATION VERIFICATION

Alta Analytical Perspectives

Initial Calibration Date: 10/05/00

GC Column ID: DB-5 Instrument ID: MM-1

24 1200

Date

Reviewer:

S#4 Analysis Date: 23-PEB-01 Time: 13:52:50 VER Data Filename: 010223P1

CONC. RANGE FOUND (ng/mL)	95.07 70.0 - 130.0 103.97 70.0 - 130.0 92.47 70.0 - 130.0 90.47 70.0 - 130.0 93.07 70.0 - 130.0 90.37 70.0 - 130.0 87.77 70.0 - 130.0 82.17 70.0 - 130.0	107.3 75.0 - 125.0 104.8 75.0 - 125.0 102.4 75.0 - 125.0 105.0 75.0 - 125.0	90.8 / 75.0 - 125.0
Pass	******	***	λ.
OC LIMITS	0.65-0.89 1.32-1.78 1.05-1.43 0.88-1.20 0.76-1.02 0.65-0.89 1.32-1.78 0.43-0.59 0.37-0.51	1.32-1.78 1.05-1.43 0.43-0.59 0.37-0.51	0.43-0.59
ION ABUND. RATIO	0.79 1.55 0.85 0.79 0.52 0.52 0.88	1.56 1.26 0.52	0.52
M/Z'S FORMING RATIO	M/M+2 H+2/M+4 H+2/M+4 H+2/M+4 M+2/M+2 M+2/M+4 M/M+2 M/M+2 M/M+2 M/M+2	M+2/M+4 M+2/M+4 M/M+2 M/M+2	M/M+2
FC LABELED COMPOUNDS	13C-2,3,7,8-TCDD 13C-1,2,3,7,8-PeCDD 13C-1,2,3,6,7,8-RxCDD 13C-1,2,3,4,6,7,8-HpCDD 13C-0CDD 13C-2,3,7,8-TCDF 13C-1,2,3,7,8-PeCDF 13C-1,2,3,7,8-PeCDF 13C-1,2,3,4,6,7,8-HpCDF 13C-1,2,3,4,6,7,8-HpCDF	37C1-2,3,7,8-TCDD 13C-2,3,4,7,8-PeCDF 13C-1,2,3,4,7,8-HXCDD 13C-1,2,3,4,7,8-HXCDF 13C-1,2,3,4,7,8,9-HpCDF	13C-1,2,3,7,8,9-HxCDF

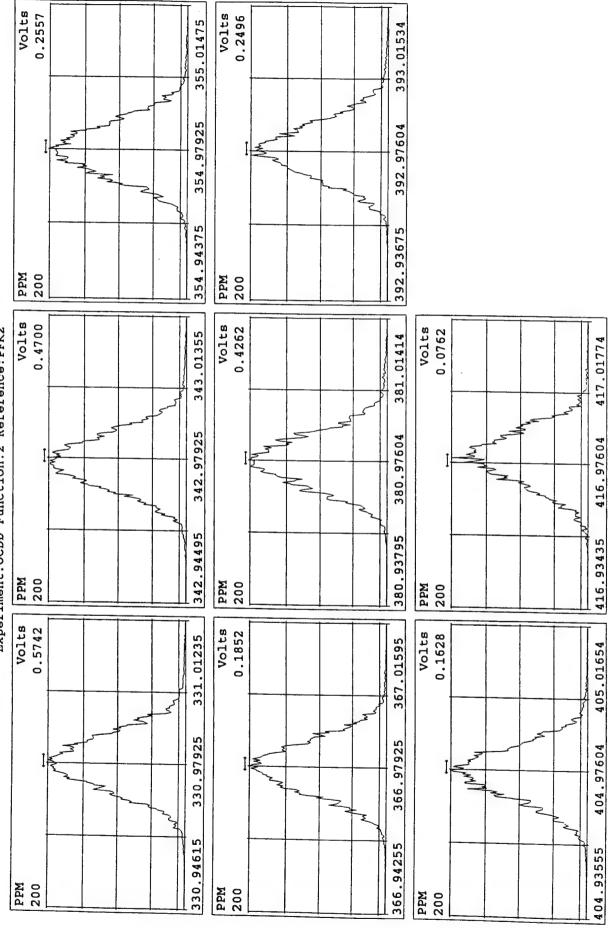
Analyst, CHE

Date: 24 Fabol

1 St 4 Acq: 23-FEB-01 13:52:50 Concal: 010223Pl- Page 10 Endcal: MM1_M23_0; wt/vol: 1.000 Endcal: 010223Pl-	_M23_0; wt/vol: 1.000 EndCal: 010223F1 onc Qualif. CDE noise Fac DL	858 2.5 0.	2428 2.5	2428 2.5 0.112	28 2.5 0.101 Revlewer: 94 2.5 0.157	50 2.5 0.0960	265 2.5 0.0266	6 2.5	215 2.5 0.06	215 2.5 0.05	215 2.5 0.06	2.5 0.1	299 2.5	7.0 0.1	8 2.5 0.0191	2.5 12.4	5 0.104	5 0.0266	.5 0.137 20.5	0.250	92.2 0.0647 101 0.109 48.2	Rec	95.0	92.4	90.4	3.0	90.3	82.17	82.4	1 1		107 -
S: 4 Acq: 23-FEB-01 13:52:50 ConCal: ICal: MM1_M23_0; wt/vol: 1.000 EndCal:	_M23_0; wt/vol: 1.000 EndCal: 010223F1 onc Qualif. CDE noise Fac DL	858 2.5 0.	2428 2.5	2428 2.5 0.112	94 2.5 0.157	50 2.5 0.0960	265 2.5 0.0266	276 2.5 0.25	215 2.5 0.06	215 2.5 0.05	215 2.5 0.06	299 2.5 0.1	299 2.5 0.1	091.0 6.2	8 2.5 0.0191	2.5 12.4	5 0.104	5 0.0266	5 0.137	0.250	0.0647 0.109 4	Rec	0.4	92.4	14.06	3.0	90.3	82.17	82.4	1 1		Anal.
S: 4 Acg: 23-FEB-01 13:52:50 ICal: MMI_M23_0: wt/vol: 1.000	_M23_0's wt/vol: 1.000 onc Qualif. CDE noise Fac	858 2.5 0.	2428 2.5	2428 2.5 0	94 2.5 0	50 2.5 0.	265 2.5 0.026	276 2.5 0.25	215 2.5 0.06	215 2.5 0.05	215 2.5 0.06	299 2.5 0.1	299 2.5 0.1	7.0 0.1	8 2.5 0.01	2.5	ů, n	הייני	່	0	•	•										
S: 4 Acq: 23-FEB-01 13:52:50 ICal: MM1_M23_0; wt/vol: 1	_M23_0* wt/vol: 1.000 onc Qualif. CDE noise F	858 2	2428 2	2428 2	94 2	50 2	265 2.	276 2.	215 2.	215 2.	215 2.	299 2.	299 2.		8 2.	7			ini	10												
S: 4 Acq: 23-FEB-01 13:52:50 ICal: MM1_M23_0; wt/vol: 1	_M23_0, wt/vol: 1.000 onc Qualif. CDE no				2 2	w	12	88 8 8 8	328	32	32	32	2 5			9	NO	4 10	412	76 2.	15 2.5 99 2.5	i										
S: 4 Acq: 23-FEB-01 ICal: MM1_M23_0;	_M23_U* wt/vol onc Qualif.	5.72											m -	7		3117	24	12	4.5	82	321											
S: 4 Acq: 23-FEB-01 ICal: MM1_M23_0;	_M23_0* onc Quali	5.72	. ~																													
St 4 Acqt	MMI_M23_	5.72	. ~																													
ŝ	Σ		25	26.6	25.3	52.1	4.75	25.2	24.7	24.5	24.1	24.3	23.3		22.6	71.5	46.8	12.0	20.5	71.4	100		95.0 104	92.4	90.4	· ~	90.3	82.1	82.4	100	100	107
ŝ	E CAL	60 V		~ v		_	4.1	r 4		_																						
1 1 - 10		33:0	37:0	37:0	41123	4614	2614	32:44	36:01	36:10	37:49	- 6	42:12	:	23:52	30:33	40:12	21:10	28:44	31:37	34:38		33:04	37:06	41:22	26:43	31:36	39:45	47:00	26:56 25:19	7	27:38
0223P	RRF		-	1.02	1.13	1.03	1.05	1.04	• •	2 .			1.30	•	1.26	1.01	1.13	1.05	1.05	1.05	1.14	•	0.93	6.	0.91		0.96	0.90		1.00	•	0.51
1 60 1		N 9	1.25 y	1.26 y	1.03 y	0.88 ×	0.74 y/	54 Y	23 Y		22 ×		.02 %				7 × ×			4 y	2 y y		, , , ,	1	* >	, »	2 Y	' >		7 % / %	7 ×	,
Pag Filename: GC Column	ים כפד מר כפד	0 -					9.				1.22			•	۰,	-					1.26		1.56				1.59	0.45	0.8	0.82	1.2	-
	y des	.69e+0 .60e+0	1.43e+07	1.32e+07 1.50e+07	1.32e+07	1.92e+07	.36e+0	2.01e+07 2.03e+07	1.77e+07	1.92e+07	1.57e+07	1.56e+07	1.27e+07 2.12e+07		.86e+07	4.20e+07	2.44e+07	1.10e+07	.65e+07	.74e+07	7.24e+07 2.83e+07	F00+07	5.80e+07	4.86e+07	4.61e+07	8.76e+07	7.68e+07 6.34e+07	4.18e+07	3.77e+07	6.03e+07 8.88e+07	5.64e+07	3.59e+07
53 123 CS3		~				OCDD 1							7	1	-					ın												3.
-2001 17:53 CPSM / M23	2 (7,8-Pe	1,2,3,4,7,8-BxCDD	7,8-HX 8,9-HX	7,8-Hp	5	2,3,7,8-TCDF	7,8-Pe	1,2,3,4,7,8-HXCDF	7,8-HX(8,9-HX(1,2,3,4,6,7,8-HpCDF	1,2,3,4,7,8,9-HpCDF OCDF		Tetra-Dioxins	Total Penta-Dioxing Total Heva-Dioxing	Total Hepta-Dioxins	Total Tetra-Furans	Penta-Furans	Penta-Furans Pechr Totala	Total Hexa-Furans Total Hepta-Furans	7E-0	, 8-Pec	, 8-HXC	, 8-HPCDD	13C-2,3,7,8-TCDF	,8-PeC	, 8-нрс	13C-0CDF	3,4-TC	, 9-HxCl	7,8-TCI
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1 7 5			1,	1 1	1,2,			, •	-1.	1,0	, ,	1,2,	1,2,		Total	Total	Total	Tota	1st Fnc.	Total	Tot	=======================================	13C-1,2,3,7,8-PeCDD	130-1,2	13C-1,2,3,4,6,7,8-HpCDD	13	13C-1,2,3,7,8-PeCDF 13C-1,2,3,6,7,8-HxCDF	13C-1,2,3,4,6,7,8-HPCDF		13C-1,2,3,4-TCDD 13C-1,2,3,4-TCDF	3C-1,2	37C1-2,3,7,8-TCDD
OPUSquan Client Lab Il																			1			v.		;	15 15	70		IS 13C			RS/RT 1	PS

Volts 0.1622 Volts 0.1905 317.01415 355.01475 316.98245 354.97925 316.95075 354.94375 PPM 200 PPM 200 Peak Locate Examination:23-FEB-2001:14:59 File:RES_CHECK Experiment:0CDD Function:1 Reference:PFK2_ Volts 0.2879 Volts Volts 0.1361 305,01295 343.01355 381.01414 304.98245 342.97925 380.97604 M 304.95195 342.94495 380.93795 PPM 200 PPM 200 PPM 200 Volts Volts 0.7636 Volts 293,01175 331.01235 367.01595 292.98245 330,97925 366.97925 292.95315 330.94615 366.94255 PPM 200 PPM 200 PPM 200

Peak Locate Examination:23-FEB-2001:15:00 File:RES_CHECK Experiment: OCDD Function: 2 Reference: PFK2



Volts 0.2345 Volts 0.3177 431.01594 393.01534 430.97284 392.97604 392,93675 430.92974 PPM 200 PPM 200 Volts Volts 0.1556 Volts 0.1470 417.01774 455,01834 Experiment: OCDD Function: 3 Reference: PFK2 381.01414 416.97604 380.97604 454.97284 380,93795 416.93435 454.92734 PPM 200 PPM 200 PPM 200 Volts 0.1539 Volts 0.2848 Volts 367.01595 405.01654 443.01714 366.97925 404.97604 442.97284 366.94255 404.93555 442.92854 PPM 200 PPM 200 PPM 200

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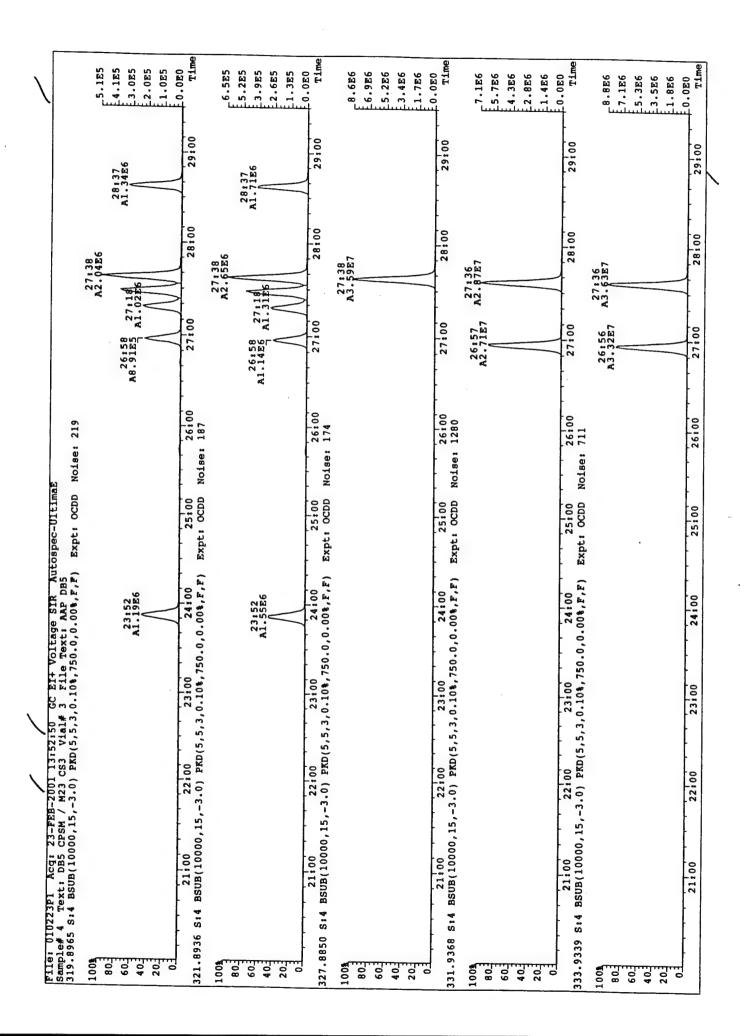
Peak Locate Examination: 23-FEB-2001:15:00 File: RES_CHECK

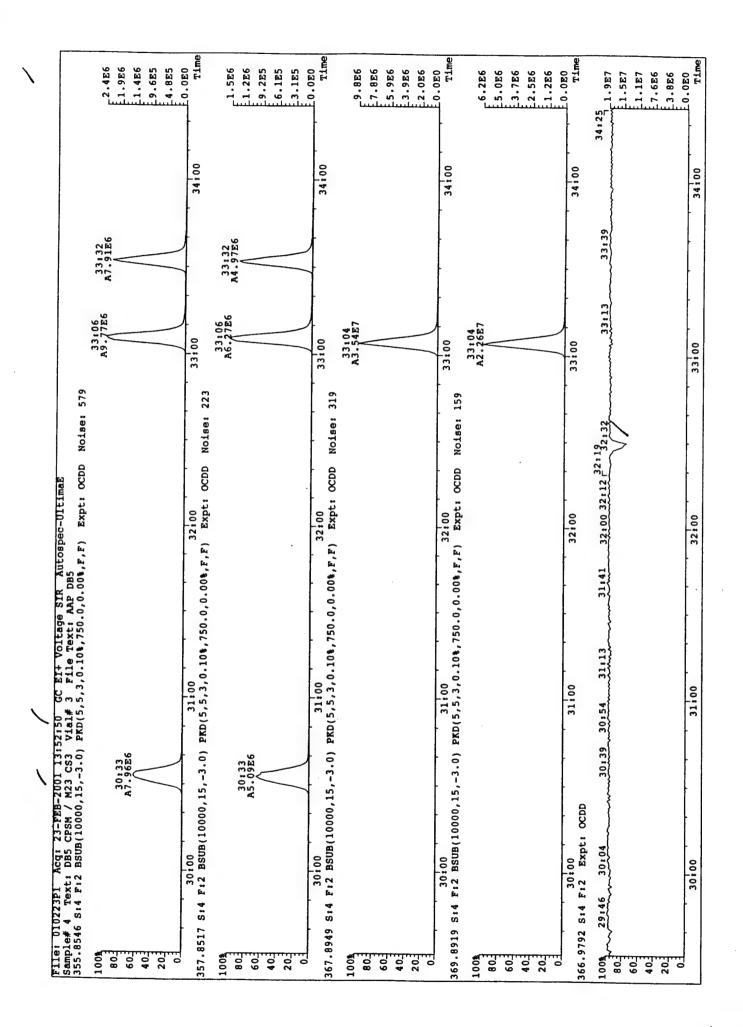
Volts 0.2726 Volts 0.1236 431.01594 467.01954 430.97284 466.97284 430.92974 466.92614 PPM 200 PPM 200 Peak Locate Examination: 23-FEB-2001:15:00 File: RES_CHECK Volts Volts 0.2762 0.1426 Experiment: OCDD Function: 4 Reference: PFK2 417.01774 455.01834 416.97604 454.97284 416.93435 454.92734 PPM 200 PPM 200 Volts Volts Volts 0.1316 405.01654 443.01714 404.97604 442.97284 404.93555 442.92854 480.92157 PPM 200 PPM 200 PPM 200

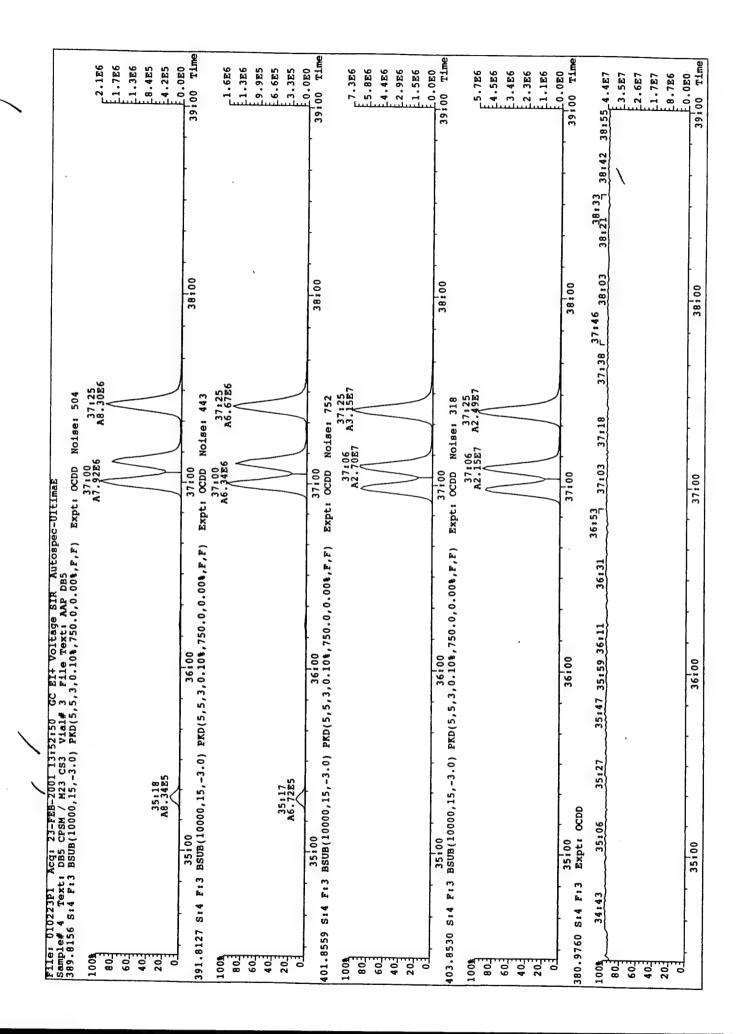
481.01776

480.96967

Volts 0.1768 Volts 0.2649 455.01834 493.01896 454.97284 492.96967 454.92734 492.92037 PPM 200 PPM 200 Peak Locate Examination:23-FEB-2001:15:01 File:RES_CHECK Experiment:OCDD Function:5 Reference:PFK2_ Volts 0.2299 Volts 0.1731 Volts 481.01776 443.01714 517.02136 442.97284 480.96967 516.96967 ₹ 3 442.92854 480.92157 516.91797 200 PPM PPM 200 PPM 200 Volts 0.2255 Volts 0.1338 Volts 431.01594 467.01954 505.02016 430.97284 466.97284 504.96967 430.92974 466.92614 504.91917 PPM 200 PPM 200 PPM 200







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	lo o		0350			_	00	750.0,0.00%,F,F)	A6.48E6				_	00	750.0,0.00%,F,F)	41:21 A2.37E7				_		750.0,0.00%,F,F)	41:21 A2.25E7				_	00	41.74	102 41124 41141				00
\	3:52:50 GC EI+ Vo. 3 Vial# 3 File Te 0) PKD(5,5,3,0.10%;		0					0) PKD(5,5,3,0.10%,	2 E6					41100	BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,						00:11	-3.0) PKD(5,5,3,0.10%,						4116	40.48	14 40178 40148 41				4110
	File: 010223P1 Acq: 23-FEB-2001 [3:52:50 GC EI+ Voltage SIR Autosp Sample# 4 Text: DB5 CPSM / M23 CS3 Vial# 3 File Text: AAP DB5 423.7767 S:4 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,750.0,0.00%,F.F.)	40:11	A3.6/1					BSUB(10000,	40:12 A5.49E6					40:00							00,00	BSUB(10000,15,						40:00	Expt: OCDD	39:43 40:09				40,00
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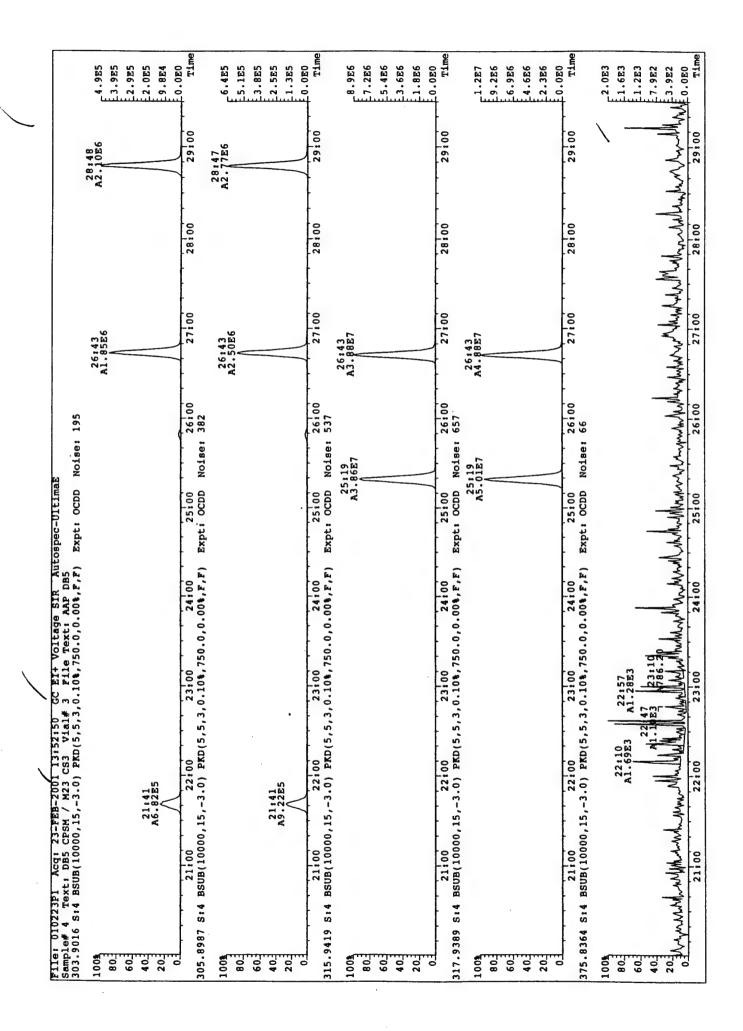
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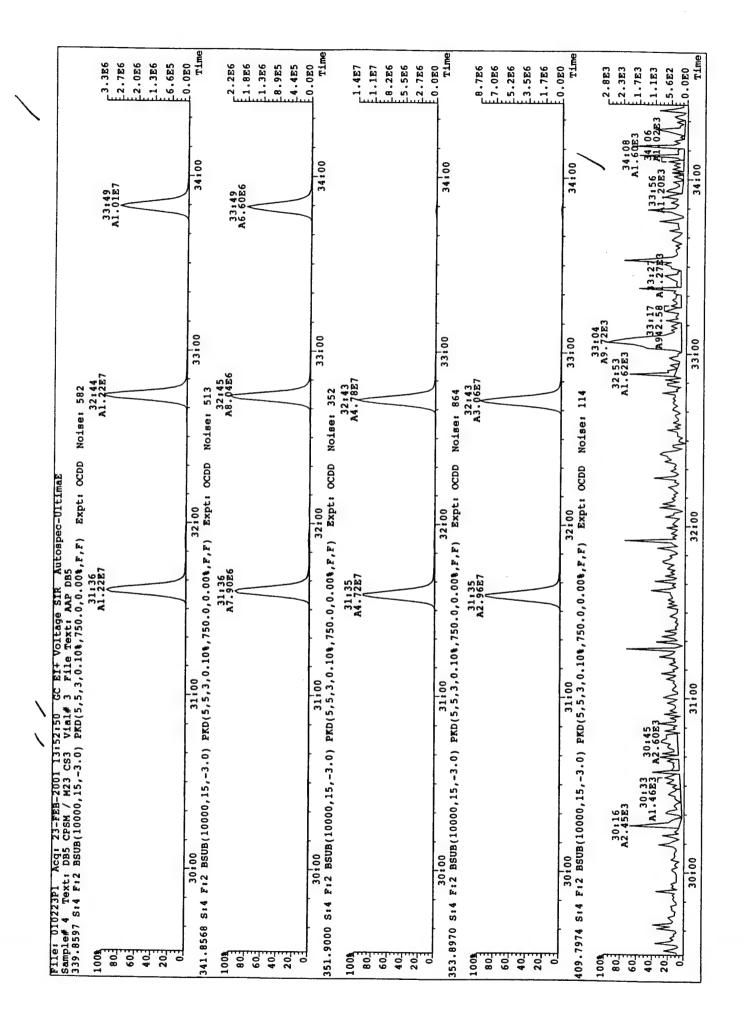
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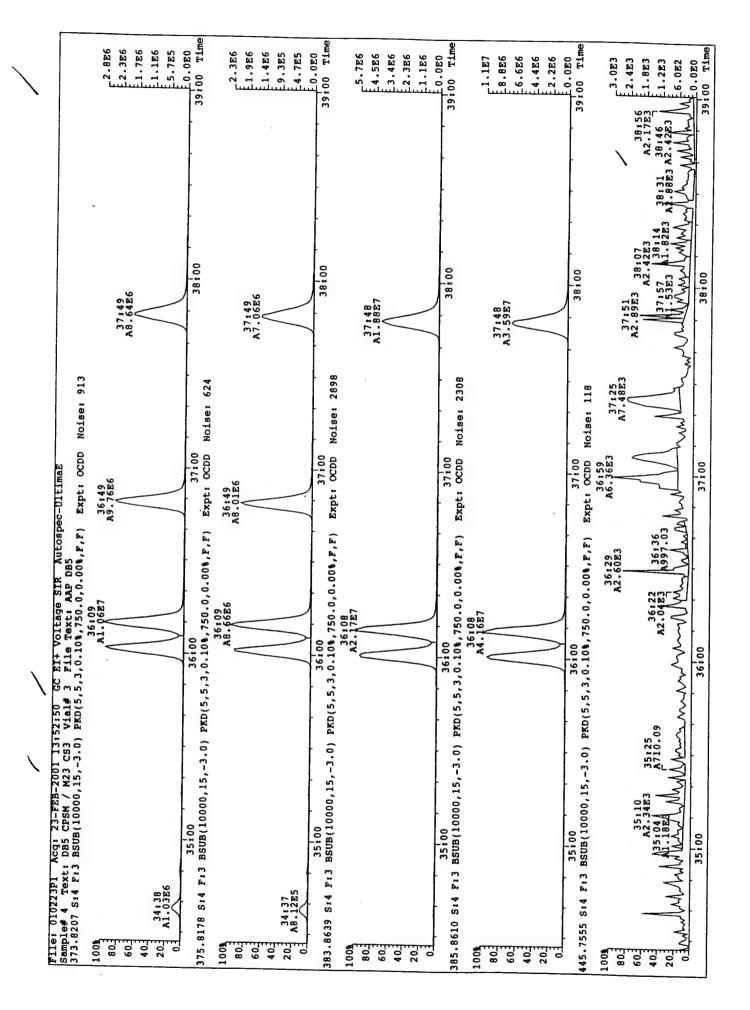


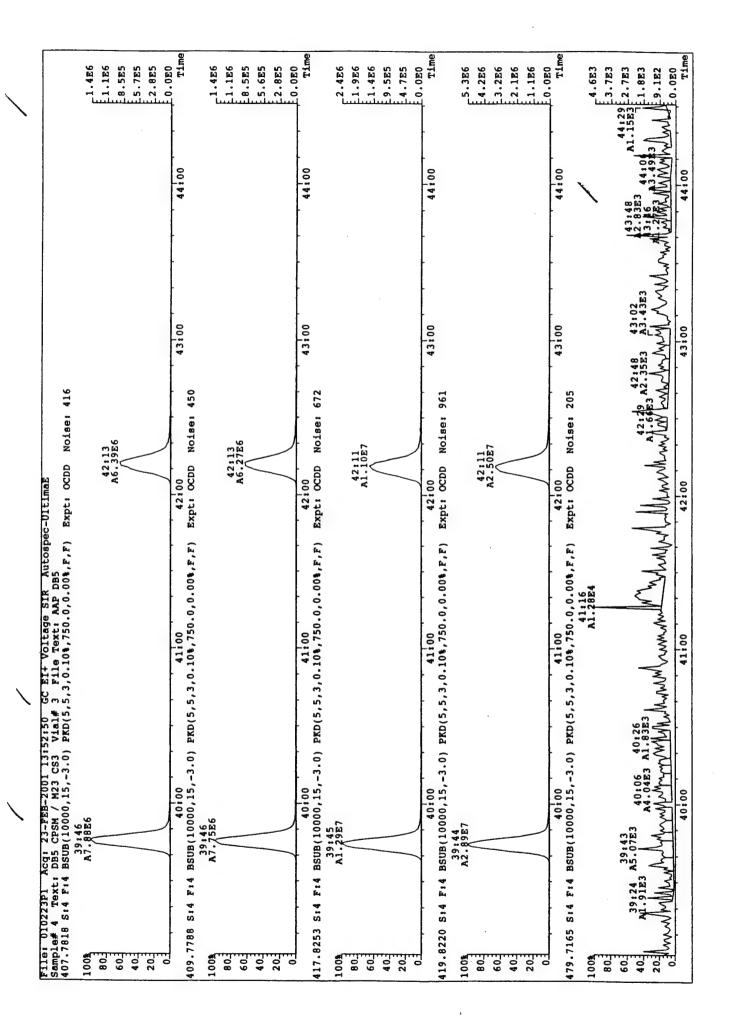
	2.7E6 2.4E6 2.2E6 11.9E6 1.4E6 11.1E6 8.1E5 5.4E5	1.6E6 1.5E6 1.3E6 1.1E6 1.1E6 1.1E6 1.1E6 1.1E5 1.6E5 1.6E5	Time	1.8E7 1.5E7 1.3E7 1.1E7 1.1E7 1.1E7 1.2E6 5.5E6 1.8E6	E0.0E0
	28:44 A1:02E7	29:00 28:44 A6.29E6	29:00	143 29:03	29:00
		28 : 00	28:00	27:39 28:16 	28:00
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3e: 63			26:00	25:39 26:08 26:25	26:00
spec-UltimaE Expt: OCDD Noise:		Expt: OCDD Noise:	25:00	24:47 ^{25:20} 25:	25:00
age SIR Autos t: AAP DB5 ,0.00%,F,F) E		24:00 0.00%, F, F)	24:00	24:27 2	24:00
0223P1 Acq: 23-FEB-2001 13:52:50 GC EI+ Voltage SIR Autospec-UltimaE 4 Text: DB5 CPSM / M23 CS3 Vial# 3 File Text: AAP DB5 S:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,750.0,0.00%,F,F) Expt: OCDD 1		22:00 23:00 -3.0) PKD(5,5,3,0.10%,750.0,	23:00	22:59 23:21	23:00
5B-2001 13:52: / M23 CS3 V14 5,-3.0) PKD(5,5		l •	22:00	21,56 21,39 21,39 22,111	22:00
JPI Acq: 23-F] Gat: DBS CPSM BSUB(10000,15		21:00 BSUB(10000,15	21:00 Expt: OCDD	413 413	21:00
File: 010223P1 Sample# 4 Tex 339.8597 S:4 B	100% 800 100 100 100 100 100 100 100 100 100	341.8568 S:4 9008 900 700 600 400 100	316.9824 S:4	20:08 700 600 600 100 100 100 100 100 1	

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`		1.286	7.125	2.4E5	48:00 Time	926-13	1.186	5.355	48:00 49:00 Time	F2.1E6	1.756	8.655	020.03	48:00 49:00 Time	F 2.486	-1.9Eb	19.785	48:00 49:00 Time	2.3E3 E1.8E3	1.4E3	Monday Many Manney	49
	Acq: 23-FEB-2001 13:52:50 GC E1+ Voltage SIR Autospec-UltimaE DBS CPSM / M23 CS3 Vial# 3 File Text: AAP DBS BSUB(10000,15,-3.0) PKD(5,5,3,0:10%,750.0,0:00%,F,F) Expt: OCDD Noise: 138	A9.99E6			Noise: 289	47:00 A1.12E7			Noise: 172	47:00 A1.76E7				Noise: 1461	47:00 A2.00E7			46:00 ,-3.0) PKD(5,5,3,0.10%,750.0,0.00%,F,F) Expt: OCDD Noise: 99	45:53 A1:90E3		the wild of which I'm Under the Marker the	46:00 47:00 48
13.56	: 010223F1 1e# 4 Text: 7428 S:4 F:5	800	600 400 400	203	45:00 443.7398 S:4 F:5 BSUB(10	100%	09	20	7830 S:4	100%	# 80 80 90 90	403	-	455.7801 S:4 F:5 BSUB(10	100%	60	200	45:00 513.6775 S:4 F:5 BSUB(10000,15	100% 80=	A	20 Thy hay how his	45:00

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ALTA ANALYTICAL PERSPECTIVES

PART 4D

SYSTEM PERFORMANCE

"INITIAL CALIBRATION"

DOCUMENTATION FOR THE ANALYSIS

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						Membra	CAOSIST	02 / 1004	20 (2		#2#J		San Carried San C	2(3 3(44)		O & OCTOM)						7	2	,	1.1	T	1.	12000												
	Page 1 of 1		Samp# 9 500	RRF#7	,	1.26	D	1.20	10.1	1.22	1.01		20.1	1.00	0.7	1.1/	1.17	1.04	1.58	1,38	1.14		1.13	1.00	0.92	0.80		1.00			œ	5	00.	1.00		0.53	0.93	06.0	0.87	0.85	1.00
			Samp# 8	RRF#6		1.27		0 47	1,09	1.10	1.08		•	•		91.1		96.0	1.50	1.23	1.19		Ţ	0.99	ů.	ÿr	1.11	. 0	m	0.90	•	1,00	•	1.00		0.52	96.0	0.93	0.88	0.86	1.06
		IM-1	Samp# 7 50	RRF#5	1 27	7 2 1	1.21	1.07	1.20	1.19	1.08	30.1	00.1	1.12	1 20	1.29	1.25	1.10	1.63	1.39	1.19	'	፣ '	96.0	, c	, ,	٠.	6	۳.	0.92		1.00	1.00	1.00		20 (ė.	0.93	٥.	0.86	1.10
		Inst. ID. MM-1	Samp# 6	RRF#4	1 27	1.06	1.19	1.07	1.21	1.17	1.08	1.04	00.1	1.12	1.20	1.29	1.24	1.09	1.63	1.39	1.19		100	200		99.0	1.01	0.91	1.21	0.85	# / • 0	1.00	1.00	1.00		0.52	10.1	0.93	0.94	68.0	1.06
	ectives	0919	Samp# 5	RRF#3	1.25	66.0	1.12	1.03	1.12	1.07	0.99	0.98	9	1.03	1,13	1.23	1.15	1.01	1.51	1.27	1.13	•	1.12	8.0	94	۱ r		0.89	1.28	0.94	•	1.00	1.00	1.00		0.51	66.0	0.93	0.92	0.85	1.09
	lta Analytical Perspectives	mm1_m23_000919	Samp# 4 0.50	RRF#2	1.21	0.93	1.08	0.97	1.10	1.05	0.95	0.97	0.98	1.01	1.05	1.20	1.11	0.97	1.45	1.19	1.05	٠	7.17	. 0	88.0	0.71	1.11	0.97	1.31	0.90		1.00	1.00	1.00	1	0.51		0.93	0.91	0.83	1.08
	ita Analyt	Calr	Samp# 3 0.25	RRF#1	1.30	0.98	1.08	1.04	1.11	1.10	1.00	1.01	1.02	1.01	1.11	1.21	1.16	0.97	1.49	1.24	1.15	-	100	0.95	96.0	0.77	1.05	06.0	1.31	96.0	5	1.00		1.00		0.50	0.00	0.00	26.0	0.85	1.00
Page 1	×	Analyte: m23mm1_cal		RSD	2.04 %	5.08	5.15 %-	*	4.26 %	.87	5.02 %	7.26 %	4.06 %		5.67 %	4.10 %-		5.76 \$-		.39	4.37 %	3.53.57	•	2.49 %	-	*	3.69 1	*	3.33 %	4.81 %		0.00	00.0	0.00	•	2.54 \$		•		2.09 4 7	TT.C
	Summary (Analyte:		Mean RRF	1.26	1.01	1.14	1.02	1.14	1.13	1.03	1.05	1.04	1.05	1.13	1.24	1.16	1.02	1.54	1.30	1.15	1.13	0.93	0.93	0.91	0.73	1.06	96.0	1.28	0.90		1.00	1.00	1.00		16.0		20.0	1 2 0	1.07	•
OPUSquan 16-OCT-2000	Initial Calibration RRF Summary (ICAL)	Run: 001005P1	Data filename: 001005P1	Name	2,3,7,8-TCDD	1,2,3,7,8-PeCDD	1,2,3,4,7,8-HxCDD	1,2,3,6,7,8-HxCDD	1,2,3,7,8,9-HxCDD	1,2,3,4,6,7,8-HpCDD		2,3,7,8-TCDF	1,2,3,7,8-PeCDF	2, 3, 4, 7, 8-PeCDF	1,2,3,4,7,8-HxCDF	1,2,3,6,7,8-HXCDF	2, 3, 4, 6, 7, 8-HXCDF	1,2,3,7,8,9-HXCDF	1,2,3,4,6,7,8-HpcDF	1,2,3,4,7,8,9-HpCDF	JOSO TO THE PROPERTY OF THE PR	13C-2,3,7,8-TCDD	13C-1,2,3,7,8-PecDD	13C-1,2,3,6,7,8-BxCDD	13C-1,2,3,4,6,7,8-HpCDD	13C-OCDD	13C-2, 3, 7, 8-TCDF	13C-1,2,3,7,8-PeCDF	13C-1, 2, 3, 6, 7, 8-BXCDF	13C-0CDF		13C-1,2,3,4-TCDD	13C-1,2,3,4-TCDF	13C-1,2,3,7,8,9-HxCDD	37C1_2 3 7 8_TCDD	13C-2,3,4,7,8-1CDD	13C-1.2.3.4.7.8-B×CDD	13C-1,2,3,4,7,8-0xCDF	13C-1.2.3.4.7.8.9-Brons	13C-1,2,3,4,7,8,9-HWCDF	***************************************

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ALTA ANALYTICAL PERSPECTIVES

PART 4E

SYSTEM PERFORMANCE

"ON-GOING PRECISION & ACCURACY"

DOCUMENTATION FOR THE ANALYSIS

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Page 2 of 2 # 275_OPR_23,TIF 24 Reb Ø Analyst: 646 Reviewer: Date:_ Time: 11:57:29 ALL CONCENTRATIONS REPORTED ON THIS FORM ARE CONCENTRATIONS IN EXTRACT. 18.8 - 31.2 18.8 - 31.2 - 31.2 - 31.2 - 31.2 - 31.2 - 31.2 - 31.2 18.8 - 31.2 18.8 - 31.2 3.75 - 6.25 18.8 - 31.2 37.5 - 62.5 18.8 - 31.2 18.8 - 31.2 - 6.25 37.5 - 62.5 OPR CONC. LIMITS (ng/mL) OPR Data Filename: 010214P1-2 PCDD/PCDF ONGOING PRECISION AND RECOVERY (OPR) 18.8 18.8 18.8 3.75 18.8 Analysis Date: 14-FEB-01 22.5 7 23.9 7 23.1 Alta Analytical Perspectives 22.2 / 47.9 4.23 / 24.9 / 24.5/ EPA METHOD 23 / TO9A / 428 4.94 25.4 / 23.6 23.17 44.4 22.37 (ng/mT) CONC. FOUND Page 1 (ng/mr) SPIKE CONC. 5.0 5.0 25 25 20 25 25 25 25 25 20 25 Shift: 1,2,3,4,6,7,8-HpCDD 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF 23-FEB-2001 19:14 1,2,3,4,7,8-HxCDD 1,2,3,6,7,8-HxCDD 1,2,3,7,8,9-HxCDD 1,2,3,4,7,8-HXCDF 1,2,3,6,7,8-HXCDF 2,3,4,6,7,8-HXCDF 1,2,3,7,8,9-HXCDF NATIVE ANALYTES 1,2,3,7,8-PeCDD 1,2,3,7,8-PeCDF 2,3,4,7,8-PeCDF 2,3,7,8-TCDD 2,3,7,8-TCDF Matrix (MM5/PUF): OCDD OCDF Ext. Date: OPUSquan

OPUSquan 23-FEB-2001 19:14	Paç	Page 1			
EPA	EPA METHOD 23 / TO9A	T09A / 428			Page 2 of 2
PCDD/PCDF ONG	PCDD/PCDF ONGOING PRECISION AND RECOVERY (OPR)	IND RECOVER	r (OPR)		
Alta	Alta Analytical Persp	Perspectives		J	
Matrix (MM5/PUF):	OPR Data F	OPR Data Filename: 010214P1-2	10214P1-2	Reviewer	
Ext. Date: Shift:	Analysis D	Analysis Date: 14-FEB-01	3-01 Time: 11:57:29	Date: 2 1700	
ALL CONCENTRATIONS REPORTED ON THIS FORM ARE CONCENTRATIONS IN EXTRACT.	D ON THIS FORM A	RE CONCENT	ATIONS IN EXTRACT.		
	SPIKE CONC. (ng/mL) (CONC. FOUND (ng/mL)	OPR CONC. LIMITS (ng/mL)		
LABELED COMPOUNDS					
13C-2,3,7,8-TCDD	200	201	80.0 - 260		
13C-1,2,3,7,8-PeCDD	200	214 /	80.0 - 260		
13C-1,2,3,6,7,8-HxCDD	200	198 /	80.0 - 260		
13C-1,2,3,4,6,7,8-HpCDD	200	199 🗸	80.0 - 260		
13C-0CDD	200	183 /	80.0 - 260		
13C-2,3,7,8-TCDF	200	196	80.0 - 260		
13C-1,2,3,7,8-PeCDF	200	202	80.0 - 260		
13C-1,2,3,6,7,8-HxCDF	200	179	80.0 - 260		
13C-1,2,3,4,6,7,8-HpCDF	200	180 /	80.0 - 260		
13C-0CDF	200	178/	80.0 - 260		

Analyst: 546 Date: 34 Fe501

OPTICALISA							,				
or orduan	43-FEB-2001 19:14		Page	1		\	\				
Client Lab ID	Client ID: 0 275 OPR001 Lab ID: 0 275 OPR001	E 0	Filename: GC Column	010214P1 ID: db-5	S	2 Acq: 14-FEB-01 ICal: MM1 M23 0*	11:57:29 wt/vol:	1.000	Concal	010214P1-	Page 2 of
	2				1	1))	מימים	14617010	
	2 . 3 . 7 . BTCDI	dsay c	4 6		RT	Conc Qualif	lif. CDE	noise F	ac ac		
	1.2.3.7.8-PACUD	4 5	7 000	1.20	27:44	4.94		æ	0.03		
	1.2.3.4.7.8-HYCDI			1017	33:12	24.9		9	5 0.04		
	1.2.3.6.7.8-H×CDI			1.14	37 106	25.4		774 2	5 0.2		
	1.2.3.7.8.9-8×00		1.26 y	1.02	37:13	24.5		2	5 0.2		,
	1.2.3.4.6.7.8-HPCDD	5 969+06	1.50	1.14	3/132	24.3		774 2	5 0.2	Reviewers	ي ک
	•	8.430+06		1.13	41131	23.0		433 2	.5 0.270		1
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	2,3,7,8-TCDF	1.850+06	0.75 4	-	26.61	•				Date	
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	2.3.4.7.8-Decor	0.30610	1.34 V	٠,	31143	\sim		090 2	0		
	1 2 3 4 7 B HACDE				32:51	\sim		0 2	5		
	1 2 2 6 7 0 HILLDE			1.13	36:07	22.5		199 2	5		
	2.3.4.6.7 B-HXCDF	8.6/e+06		1.24	36:16	c		199 2	0		
	1.2.3.7.8.9.HVCDF			1.16	36155	23.1		199 2	5 0.		
	1.2.3.4.6.7.8-HDCDE		1.20 7	1.02	37:56	ro o		199 2	5 0.		
	1,2,3,4,7,8,9-HDCDF			1.04	39153	22.3		7	2		
	OCDF		7.02 y	1.30	42:20	0		301	5		
		•		7117	T:/	44.4		119 2	2		
٠.		2.09e+06		1.26	21:51	4.95		,	•	EMPC	
	Total Penta-Dioxing	7.32e+06	1.56 y	0	33112	. 4		308 2.	<u> </u>	2.00	
	Total Hexa-Dioxins	1.92e+07		1.10	37:06	74.1		000	. ,	25.1	
••	Total Hepta-Dioxing	6.09e+06	V 06.0	1.13	40:20	23.5		2 6 6 6 7	٠,	74.4	
•		1.89e+06	0.78 y	1.05	25:28	4.32		1510 2	9	23.9	
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	יסכתי יוכ"סרמיינ חדמוופ	1.286+0/	1.03 y	4.	39153			2	0.1	4	
	13C-2.3.7.8-TCDD	6.690+07	7. 07.0		~					Rec	
	13C-1,2,3,7,8-PeCDD	5.816+07	1.54	200	22.10	201				101	
13	13C-1,2,3,6,7,8-HxCDD	4.71e+07	1.25	6.0	37:12	109				107	
13	13C-1,2,3,4,6,7,8-HpCDD	4.59e+07	1.06 v		41:30	100				0.	
	13C-OCDD	3.43e+07	7		46:50	183				9.5	
	13C-2,3,7,8-TCDF	8.34e+07	0.78 y		26:49	196				11.	
	3C-1,2,3,7,8-PeCDF	7.77e+07	1.56 y		31:42	202					
	13C-1,2,3,6,7,8-HxCDF	5.86e+07	0.51 y	1.28	36:15	179				1 101 0	
	12,3,4,6,7,8-HpCDF	4.14e+07			39:52	180				, ,	
2	13C-0CDF	3.68e+07	0.88 y/		47:09	178				2.6	
RS/RT	13C-1,2,3,4-TCDD	5.878+07	70	5	27.03	c c				١.	
	13C-1,2,3,4-TCDF	8.02e+07	0.77 %	1.00	25.27	200				•	
RS/RT 13C-	13C-1,2,3,7,8,9-HxCDD	5.10e+07	.25 y	1.00	37:31	200				1	
			ı								JAC . 1001 100
	3/C1-2,3,7,8-TCDD 13C-2,3,4.7,8-PeCDF	2.31e+04	*		27:44	0.134			0	.0672	0 10
	-1,2,3,4,7,8-HxCDD	*	•		NOTE:	k 4				_ \	1.1.1.
PS 13C-	-1,2,3,4,7,8-HXCDF	1.38e+05		10.	36.06						Date: of 4 Fobo
	13C-1,2,3,4,7,8,9-HpCDF	1.35e+05	0.44 V	85	42:20	76			_/	9.259	
AS 13C-	1,2,3,7,8,9-HXCDF	4.96e+07		.07	~	•			\	0.383	
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	'								
File: 010214Pl Acq: 14-FEB-2001 11:57:29 GC EI+ Voltage SIR Aut Sample# 2 Text: 0 275 OPR001 Vial# 76 File Text: AAP DB5 319.8965 S:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,750.0,0.00%,F.F)	B-2001 II:57:2 001 Vial# 76 ,-3.0) PKD(5,5	9 GC EI+ Volta File Text: AAP ,3,0.10%,750.0,	ige SIR Auto DBS 0.00%,F,F)	SIR Autospec-UltimaE 15 108,F,F) Expt: OCDD	Noise: 224				
100% 801		C		9			27:44 A9.28E5		E 2.2E5
0 0 0		ון	* 401 bo. 7		1.26×1.000	1 9.5 5.5			1.355
20						.J			4.4E4
21:00 321.8936 S:2 BSUB(10000,15,		22:00 23:00 -3.0) PKD(5,5,3,0.10%,750.0,0.0	24:00 0%, F, F)	25:00 Expt: OCDD	26:00 Noise: 144	27:00	28:00	29:00	Time
100%							27:45 Al.16E6		-2.8E5
60-									2.2E5
									1.125
21:00	22:00	22:00 23:00 3:00 3:00 3:00 3:00 3:00 3:0	24:00	25,00	26:00	27:00	28:00	29:00	Time
	Cirlary (Sec.		41.7160				27:45 A2.31E4		F7.9E3
60 60 40 40 20:31	21:42 A4.79E3 A3.5	22:51 A3.51E3 23:18 AAM M ALAM MANANA	24:29 24:05 A3:90E3	24:59 A1.04E4 A24:48	25:20 26:18 7 73:6553 73:3953 7 1. MAJA M. PGA9:23	26:50 E3 A1.12E4 23.4////	27:48 A8:40E3 28:	8:25 28:44 -53E3 A4:14E3	6.4E3 4.8E3 3.2E3
S S 12	22:00 ,-3.0) PKD(5,5,	21:00 23:00	24:00 0%, F, F)	25:00 Expt: OCDD	Noise: 1370	27:00	28:00	29:00	Time
						27:04 A2.60E7	27:43 A2.96E7		7.2E6
									4.356
		•							2.9E6 1.4E6
21:00 333.9339 S:2 BSUB(10000,15,	22:00 -3.0) PKD(5,5,	22:00 23:00 -3.0) PKD(5,5,3,0.10%,750.0,0.0	14:00 0%,F,F)	25:00 Expt: OCDD	26:00 Noise: 846	27:00	28:00	29:00	Time
						27:04 A3.27E7	27:43 A3.74E7		9.286
									-7.4E6
									3.756
21,00	22:00	23:00	24:00	25:00	26:00	27:00	28:00	29:00	E0.0E0
>> 4 4	^^.	>> > > > > > > > > > > > > > > > > > > >	****	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	>> -> -> -> -> -> -> -> -> -> -> -> -> -	****	***************************************	20.04	A.41110

late: 0.001%; Addi 18-255-2001 11:57:29 GC EIT VOLCAGE SIK AUCOSPO SAmple# 2 Text: 0.275_0PR01 Vial# 76 File Text: AAP DB5 189.8156 S:2 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,750.0,0.0%,F.F.) 100%	Autospec-UltimaE)*,F,F) Expt: OCDD Noise: 375 37:06 A3.80E6 37:32	920.1
		6.1ES 6.1ES 4.0ES 2.0ES
35:00 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,750.0,0.00%,F,F)	37:00 F) Expt: OCDD Noise: 314 37:06 A3.00E6 A2.88E6	- 16E
		66.285 44.685 13.185 1.585
35:00 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,750.0,0.00%,F,F)	37:00 37:12 37:12 37:31 A2.61E7 A2.83E7	96
35!00 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,750.0,0.00%,F,F)	37:00 F) Expt: OCDD Noise: 272 37:12 A2:10E7 A2:27E7	391
35:00 Expt: OCDD 35:06 35:14 35:31 ^{35:49} 35:55 ^{36:11} 36:17	37:00 38:00 38:00 38:00 38:00 38:00	38:13 38:20 38:51 5.0E7
		3.0E7 2.0E7 2.0E7 9.9E6
35:00	37:00	398

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5.455 [4.3E5 [3.2E5 [2.1E5]	5.3E5 4.2E5 3.2E5 2.1E5	4.2E6 4.2E6 3.4E6 2.5E6 1.7E6 8.4E5	4.0E6 E3.2E6 E2.4E6 E1.6E6	7	10.0E6
	44:00	44:00	44:00	43:47 44:07 44:27	
	43:00	43:00	43:00	43:05 43:26	
Expt: OCDD Noise: 270	42:00 Expt: OCDD Noise: 203	42:00 Expt: OCDD Noise: 1532	42:00 Expt: OCDD Noise: 957	1157 42:21 42:29 42:43	
16	1 1	50.0,0.00%,F,F) Expt 41:30 A2.36E7		42:0	
1137;23 GC E1+ VOITAGE SIR Autosp 111	40;00 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,750.0,0.00%,F,F) 41;31 A2:98E6	41:00	41:00 PKD(5,5,3,0.10%,75	40:31 40:5141:0	
0 275 TO 0 275 DE 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	40:00 BSUB(10000,15,-3.0	40:00 BSUB(10000,15,	41:00 41:00 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,750.0,0.00%,F,F) 41:30 A2.23E7	39:42 40:08:20	00,04
Sample# 2 Text; 423.7767 S;2 F;4 100% 80 60 40 20	425.7737 S:2 F:4 100% 803 603 400	435.8169 S;2 F;4 1008 803 603 403 203	437.8140 S:2 F:4 100\$ 80 60 20 20	430.9728 S:2 F:4 1008 39:20 37 803 403 403 203 39	F0

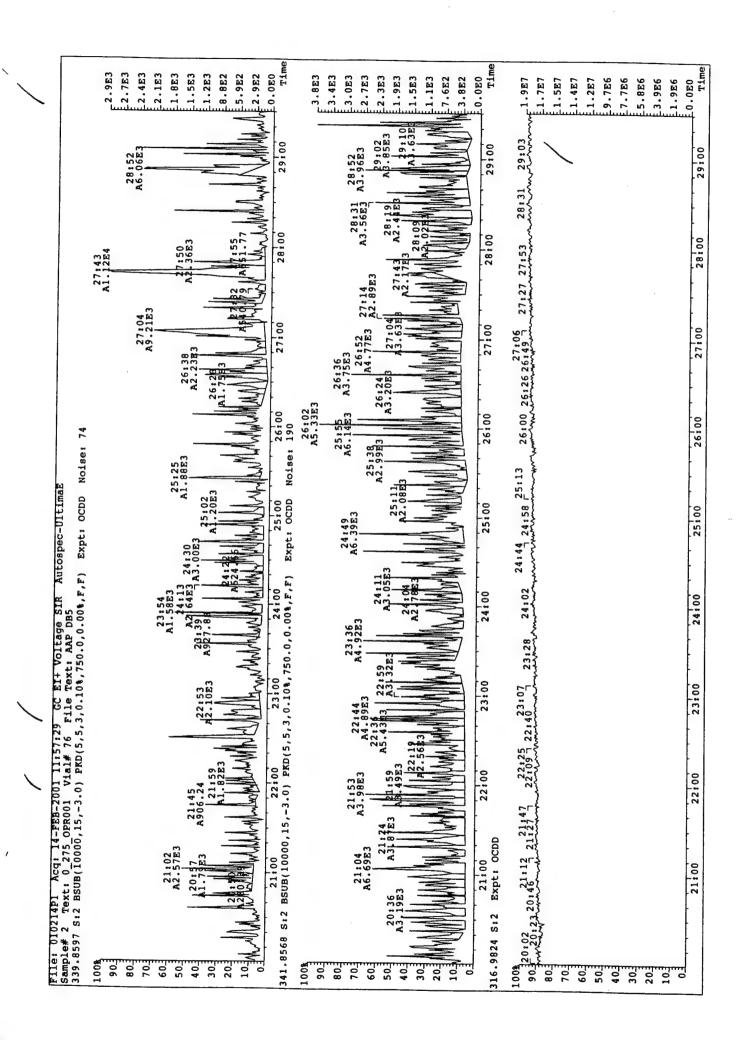
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	5.3E5 [4.2E5 [3.2E5 [2.1E5 [1.1E5	6.3E5 5.0E5 3.8E5 2.5E5 1.3E5	49:00 Time 49:00 Time 1.8E6 1.3E6 8.9E5 4.4E5	49:00 Time 2.4E6 1.9E6 1.5E6 9.7E5	48:32 48:44 55 3.3E7 2.0E7 2.0E7 2.0E7 6.5E6	49:00 Time
		48:00	48:00	48:00	48:00 47:39 47:56 48:05 48:22 4	48:00
tospec-UltimaE F.F. Expt: OCDD Noise: 273		47:00 7.F) Expt: OCDD Noise: 137 46:51 A4.50E6	47:00 47:00 46:50 Al.63E7	47:00 46:50 Al.80E7	46:41 46:59 47:20	47:00
57:29 GC EI+ Voltage SIR Autospec-UltimaE 76 File Text: AAP DB5 PKD(5,5,3,0.10%,750.0,0.00%,F.F) Expt: OC		46:00 PKD(5,5,3,0.10%,750.0,0.00%,F,F)	45:00 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,750.0,0.00%,F.F)	46:00 PKD(5,5,3,0.10%,750.0,0.00%,F,F)	46:17	46:00
File: 010214Pl Acq: 14-FEB-2001 117: Sample# 2 Text: 0 275 OPR001 Vial# 457.7377 S:2 F:5 BSUB(10000,15,-3.0)	100% 803 603 403 203	459.7348 S:2 F:5 BSUB(10000,15,-3.0) PKD(5, 1008, 803, 603, 403, 203,	45.7780 S:2 F:5 BSUB(10000,15,-3.0) 1008 803 603 403	45:00 100% 80 60 40	454.9728 Si2 Fi5 Expt: OCDD 1008 44:34 803 603 400	45:00

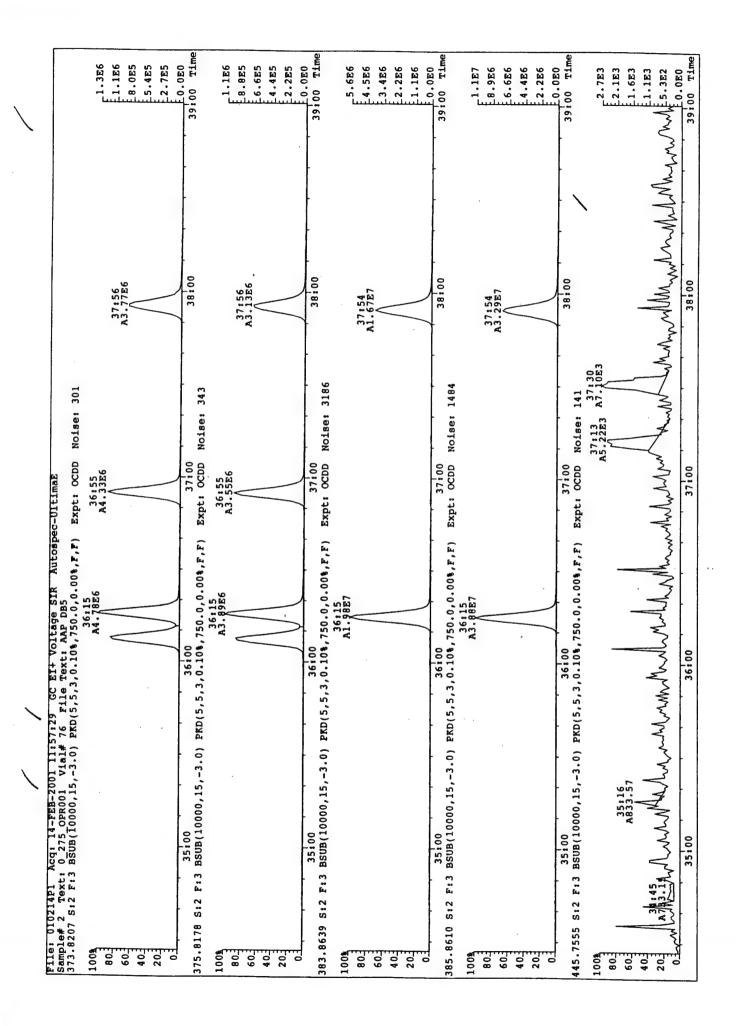
	1.9E5 1.5E5 1.1E5	7.4E4 3.7E4 0.0E0	F.2.4	2.0E5 1.5E5 9.8E4	29:00 Time	8.8E6 E7.0E6	5.3E6	29:00 Time	F 1.1E7	59.1E6 6.8E6 54.6E6	29:00 Time	5.3E3 [4.3E3 [3.2E3 [2.1E3]
		28100			28:00			28:00			28:00 29	
26151	A7.90E5	27:00	26:51 A1.06E6		27:00	26:49 A3.65E7		27:00	26:49 A4.69E7		27:00	26:15 A1.28E3
DD Noise: 168			Noise:		0 26100 D Noise: 483	25:27 A3.50E7		26:00 D Noise: 910	25:27 A4.52E7		26:00 Noise: 73	25:49 26: A1.53E3 A1.
F,F) Expt: OCDD			f,f) Expt: OCDD		30 25:00 F,F) Expt: OCDD			0 25:00 ',F) Expt: OCDD			,F) Expt: OCDD	A1.97E3 24:43 A1.97E3 A2.25E3
.le Text: AAP DB5 0.10%,750.0,0.00%,F,F)					23:00 24:00 1.10%,750.0,0.00%,F,F)			23:00 24:00 -108,750.0,0.00%,F,F)			23:00 24:00 3,0.10%,750.0,0.00%,F,F)	A1.0
5,-3.0) PKD(5,5,3,		22:00 23:00 -3 0) DED/F E 3 0 106 120 0			22:00 -3.0) PKD(5,5,3,0			22:00 23:00 -3.0) PKD(5,5,3,0.10%,750.0,0			22:00 2 -3.0) PKD(5,5,3,0.	ash was balled as some
S:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,750.0		21:00 S:2 BSUB(10000.15			21:00 :2 BSUB(10000,15,			21:00 BSUB(10000,15,			21:00 BSUB(10000,15,	20:37 20:59 A2.53E3 A1.81E3 20:30 A1.37E3 21:09
303.9016 S	80 60 40	203 0 305.8987 S	100% 803	400 200 0	315.9419 S:2	100% 804 604	0 0 0	317.9389 S:2	300m	601 2011 2011	375.8364 St2	3

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\		1.6E6 1.3E6 9.5E5	6.3E5 3.2E5 0.0E0	1.1E6 E8.6E5 E4.4E5	£2.1E5 0.0E0 Time	1.1E7 8.0E6 5.4E6 2.7E6 0.0E0	8.5E6 E.8E6 E.1E6 E.3.4E6 E.7E6 E.0.0E0	4.0E3 3.2E3 53 2.4E3 1.6E3 7.9E2 7.9E2
			34,00		34:00	34:00	34:00	34:16 A1.69E3 MAM (2.13E3
								33:31 A2:07
		99	33:00	. 99	33:00	33;00	33:00	33:10 A1.08E4 B3:00 B8E3 A1.32E3 A1.32E3 B3:00
	Noiset 209	32:50 A5.51E6	000		Noise: 740	Noise: 325		E E
	QQ		000		t: ocbb	ocpp	- Cabo	32:17 A5.10E3
) 1	31:43 A5.43E6	m _		33	32:00 0%.F.F. Expt:	31:42 A3.03E7 32:00	32
	AP DBS	~	F. F. 800.0.0.0.7.	ď	50.0,	30:00 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,750.0,0.00%,F,F		31:20 A2: A1:32E3
\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	0.275 OPR001 Vial# 76 File Text: Al BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,		30:00 F:2 BSUB(10000,15,-3.0) PKD(5,5,3.0.10%.7		30:00 31:00 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,7	31:00	31100 31100 3100 10# 75	11E3 A
7 3-71 1002-8:	0,15,-3.0) H		0,15,-3.0)),15,-3.0) PI	,15,-3.0) PR	· ·	
	an CA		30:00 :2 BSUB(1000		30:00 :2 BSUB(10000	30:00 :2 BSUB(10000	30,00 30,00 15.2 BSUB(1000,15	53 MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
01021491	Sample# 2 Text: 339.8597 S:2 F:2		203 0341.8568 S:2 F:		351.9000 S:2 F:2 803	602 402 203 0	100% 805 60 40 0	7 E

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7.4E5 6.0E5 4.5E5 3.0E5	44:00	44:00 Time Time 2.6E6	44:00 Time Time 5.7E6	3 43:36 44:05 E2.8E3 A1.90E3 A1.87E3 E1.4E3
	43:00	43:00	43:00	43:00 43:05 42:54 A2.75E3 A2.41E3
39:53 A3:60E6	41:00 -3.0) PKD(5,5,3,0.10%,750.0,0.00%,F,F) Expt: OCDD Noise: 273	40:00 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,750.0,0.00%,F,F) Expt: OCDD Noise: 559	-3.0) PKD(5,5,3,0.10%,750.0,0.00%,F,F) Expt: OCDD Noise: 819	-3.0) PKD(5,5,3,0.10%,750.0,0.00%,F,F) Expt: OCDD Noise: 297 09 41:31 40:26 42:17 A5.72E3 40:46 60:59 41:12 A1:31 A1.31E3 A3.54E3 A1.96E3 A3.64E3 A2:13 A2:24 A3.55E3 A3.64E3
39 ± 83 A 3.56 OE 6	40:00 F:4 BSUB(10000,15,-3. 39:53 A3:51E6	40:00 39:52 Al.27E7	40:00 83:52 A2.87E7	40:00 39:36 A1.71E3 40:09 39:46 A3.23E3 A3.33.33E3 A3.33.31E3 A3.33.31E3 A3.33.31E3 A3.33.31E3 A3.33.31E3 A3.33.31E3

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NW Land NW 4.352	A1.29E3 A8:44 1.3E3	/ E ^{2.2E3}	49:00 Time		11.120	1.756	2.3E6	F2.9E6	49:00 Time		F1.0E6	£1.5E6	E2.0E6	2.5RA	49:00 Time	_	1.525	2.985		F 7.385		49:00 Time	1.355	£2.6E5	5.355	6.6E5		
M.M.M.			48:00						48:00						48:00							48:00						
Munitime Meller	-		47:00 Expt: OCDD Noise: 92					47:09 A1-96E7	47:00 Expt: OCDD Noise: 1318				135	1,109	47:00 Expt: OCDD Noise: 198		<i></i>			A4.96E6	Expt: OCDD Noise: 279	47:00				47:10 A4.42E6	60	Autospec-III timaE
ATRECIA Many Many May Mary			46:00 PKD(5,5,3,0.10%,750.0,0.00%,F.F)						46:00 PKD(5,5,3,0.10%,750.0,0.00%,F,F)						46:00 ,5,3,0.10%,750.0,0.00%,F,F)						PKD(5,5,3,0.10%,750.0,0.00%,F,F)	46:00					Text: AAP DB5 3,0.10%,750.0,0.00	GC FIT VOITAGE STR AUTOBRE
warde My May war	_		45:00 5 BSUB(10000,15,-3.0) PKD(5												45:00 46:00 F:5 BSUB(1000,15,-3.0) PKD(5,5,3,0.10%						-3.0)	45,00					0275 OPR001 Vial# BSUB(10000,15,-3.0)	ACA: 14-FEB-2001 11:57:29
_	609	,	45:00 513.6775 S:2 F:5 BSUB(10000,15,-3.0)	200	E0 %	09	80	100%	455.7801 S:2 F:5 BSUB(10000,15,-3.0)	0	40		100m	•	.7830 8:2		203	4 0 0	108	100%	(10000,15,	45,00	203	60 1		100%	e# 2 Text: 428 S:2 F:5	F1 6: 0102 4D1 4CG: 14-FEB-2001

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APPENDIX D CALCULATIONS

Summary of Stack Gas Parameters and Test Results Malcolm Grow Medical Center - Andrews AFB, MD US EPA Test Method 29 - Multiple Metals Page 1 of 2

	RUN NUMBER	M29-1	M29-2	M29-3	
	RUN DATE	W129-1 2/2/01	W 29-2 2/2/01	M 29-3 2/2/01	Average
	RUNTIME	0945-1050	1230-1335	1405-1510	Average
			1200 1000	1400-1010	
	MEASURED DATA				
γ	Meter Box Correction Factor	0.995	0.995	0.995	0.995
ΔΗ	Avg Meter Orifice Pressure, in. H ₂	1.71	1.69	1.74	1.71
P_{bar}	Barometric Pressure, inches Hg	29.90	29.90	29.90	29.90
V_{m}	Sample Volume, ft ³	43.850	42.030	46.450	44.110
T _m	Average Meter Temperature, °F	102	103	103	103
P _{static}	Stack Static Pressure, inches H ₂ O	0.15	0.2	0.15	0.15
T_s	Average Stack Temperature, °F	171	172	172	172
V_{lc}	Condensate Collected, ml	354.9	339.1	356.4	350.1
CO ₂	Carbon Dioxide content, % by volu	6.3	7.2	6.0	6.5
O_2	Oxygen content, % by volume	11.6	11.9	12.3	11.9
N_2	Nitrogen content, % by volume	82.1	80.9	81.7	81.6
C_p	Pitot Tube Coefficient	0.84	0.84	0.84	0.84
Δp ^{1/2}	Average Square Root Δp, (in. H ₂ O)	0.5844	0.5811	0.5893	0.5849
Θ	Sample Run Duration, minutes	60	60	60	60
D_n	Nozzle Diameter, inches	0.310	0.310	0.310	0.310
	CALCULATED DATA				
A_n	Nozzle Area, ft ²	0.000524	0.000524	0.000524	0.000524
$V_{m(std)}$	Standard Meter Volume, ft ³	41.144	39.309	43.496	41.316
$V_{m(std)}$	Standard Meter Volume, m ³	1.165	1.113	1.232	1.170
Q_{m}	Average Sampling Rate, dscfm	0.686	0.655	0.725	0.689
P_{s}	Stack Pressure, inches Hg	29.91	29.91	29.91	29.91
B_{ws}	Moisture, % by volume	28.9	28.9	27.8	28.5
$B_{ws(sat)}$	Moisture (at saturation), % by volu	42.0	42.3	42.1	42.1
V_{wstd}	Standard Water Vapor Volume, ft ³	16.705	15.961	16.776	16.481
1-B _{ws}	Dry Mole Fraction	0.711	0.711	0.722	0.715
M _d	Molecular Weight (d.b.), lb/lb•mole	29.47	29.63	29.45	29.52
Ms	Molecular Weight (w.b.), lb/lb•mole	26.16	26.27	26.26	26.23
V_s	Stack Gas Velocity, ft/s	37.7	37.4	37.9	37.7
Α	Stack Area, ft ²	1.289	1.289	1.289	1.289
Q _a	Stack Gas Volumetric flow, acfm	2,916	2,894	2,934	2,915
Q_s	Stack Gas Volumetric flow, dscfm	1,733	1,719	1,769	1,740
Q_s	Stack Gas Volumetric flow, dscmm	49.1	48.7	50.1	49.3
	Isokinetic Sampling Ratio, %	97.3	93.7	100.8	97.3

Summary of Stack Gas Parameters and Test Results Malcolm Grow Medical Center - Andrews AFB, MD US EPA Test Method 29 - Multiple Metals Page 2 of 2

					•	
		RUN NUMBER	M29-1	M29-2	M29-3	
		RUN DATE	2/2/01	2/2/01	2/2/01	Average
		RUN TIME	0945-1050	1230-1335	1405-1510	
		EMISSIONS DATA				
		Particulate Matter				
	РМ	Target Catch, g	0.0063	0.0750	0.0711	0.0508
	C _{PM}	Concentration, gr/dscf	0.00236	0.0294	0.0252	0.0190
C _{PM}	@ 7% O	Concentration, gr/dscf @ 7% O ₂	0.0035	0.0455	0.0408	0.0299
	C _{PM}	Concentration, mg/dscm	5.41	67.4	57.7	43.5
C _{PM}	@ 7% O	Concentration, mg/dscm @ 7% O_2	8.08	104.1	93.3	68.5
	E _{PM}	Emission Rate, lb/hr	0.0351	0.434	0.383	0.284
	E _{PM}	Emission Rate, kg/hr	0.0159	0.197	0.174	0.129
		Cadmium				
	Cd	Target Catch, µg	3.55	6.7	6.33	5.51
	C^{Cq}	Concentration, mg/dscm	0.00305	0.00598	0.00514	0.00472
C _{Cd} (@ 7% O	Concentration, mg/dscm @ 7% O ₂	0.00455	0.00924	0.00831	0.00737
	E _{Cd}	Emission Rate, g/hr	0.00897	0.0175	0.0154	0.0140
		Lead				
	Pb	Target Catch, µg	434.1	554	481.2	489.9
	C_{Pb}	Concentration, mg/dscm	0.373	0.498	0.391	0.420
C _{Pb} (@ 7% O₂	Concentration, mg/dscm @ 7% O ₂	0.557	0.769	0.631	0.653
	E _{Pb}	Emission Rate, g/hr	1.10	1.45	1.17	1.24
		Mercury				
	Hg	Target Catch, µg	73.0	4.41	0.55	25.99
	C _{Hg}	Concentration, mg/dscm	0.0627	0.00396	0.000447	0.0224
-		Concentration, mg/dscm @ 7% O ₂	0.094	0.00612	0.000722	0.0335
	E _{Hg}	Emission Rate, g/hr	0.184	0.0116	0.00134	0.0658

Summary of Stack Gas Parameters and Test Results Malcolm Grow Medical Center - Andrews AFB, MD US EPA Test Method 23 - PCDD / PCDF Medical Waste Incinerator Stack Page 1 of 6

	RUN NUMBER	M-23-1	M-23-2	M-23-3	
	RUN DATE	1/31/01	1/31/01	2/1/01	Average
	RUN TIME	1026-1450	1610-2040	0910-1330	
	MEASURED DATA				
γ	Meter Box Correction Factor	0.995	0.995	0.995	
ΔΗ	Avg Meter Orifice Pressure, in. H ₂ O	1.57	1.785	1.751	0.995
P _{bar}	Barometric Pressure, inches Hg	29.90	29.90	29.90	1.70
V_{m}	Sample Volume, ft ³	172.731	182.040	180.182	29.9
T _m	Average Meter Temperature, °F	90	105	100.102	178.31
P _{static}	Stack Static Pressure, inches H ₂ O	0.15	0.15	0.2	9
Ts	Average Stack Temperature, *F	171	172	172	0.1
V _{Ic}	Condensate Collected, ml	1390.2	1256.9	1315.4	173
CO ₂	Carbon Dioxide content, % by volu	6.0	5.9	5.4	1320.8
O ₂	Oxygen content, % by volume	11.4	12.1	10.8	5.8
N ₂	Nitrogen content, % by volume	82.6	82.0	83.8	11.4 82.8
C_p	Pitot Tube Coefficient	0.84	0.84	0.84	
Δp ^{1/2}	Average Square Root Dp, (in. H ₂ O) ¹	0.5945	0.5783	0.5919	0.8 0.588
Θ	Sample Run Duration, minutes	240	240	240	
D_n	Nozzle Diameter, inches	0.310	0.310	0.310	240 0.310
	CALCULATED DATA				
A _n	Nozzle Area, ft²	0.00052	0.00052	0.00052	0.00052
$V_{m(std)}$	Standard Meter Volume, dscf	165.499	169.914	169.629	168.347
$V_{m(std)}$	Standard Meter Volume, dscm	4.686	4.811	4.803	4.767
Ps	Stack Pressure, inches Hg	29.91	29.91	29.91	29.91
B_{ws}	Moisture, % by volume	28.3	25.8	26.7	27.0
B _{ws(sat)}	Moisture (at saturation), % by volu	41.9	42.4	42.4	42.2
V_{wstd}	Standard Water Vapor Volume, ft ³	65.437	59.162	61.916	62.172
1-B _{ws}	Dry Mole Fraction	0.717	0.742	0.733	0.730
M_d	Molecular Weight (d.b.), lb/lb•mole	29.42	29.43	29.30	29.38
M_s	Molecular Weight (w.b.), lb/lb•mole	26.18	26.48	26.28	26.31
V_s	Stack Gas Velocity, ft/s	38.3	37.1	38.1	37.8
Α	Stack Area, ft ²	1.289	1.289	1.289	1.289
Q_a	Stack Gas Volumetric flow, acfm	2,965	2,869	2,947	2,927
Q_s	Stack Gas Volumetric flow, dscfm	1,776	1,777	1,803	1,785
Q _{s(cmm)}	Stack Gas Volumetric flow, dscmm	50.3	50.3	51.1	50.6
1	Isokinetic Sampling Ratio, %	95.5	98.0	96.4	96.6

Summary of Stack Gas Parameters and Test Results Malcolm Grow Medical Center - Andrews AFB, MD US EPA Test Method 23 - PCDD / PCDF Baghouse Inlet Page 2 of 6

	RUN NUMBER	M-23-1	M-23-2	M-23-3	
	RUN DATE	36922	36922	36923	Average
	RUN TIME	1026-1450	1610-2040	0910-1330	
	EMISSIONS DATA				
	DIOXINS:				
	2378 TCDD				
(ng)	Catch, ng	(0.000792)	0.000945	(0.000580)	(0.000315
(ng/dscm)	Concentration, ng/dscm, as measur	(0.000169)	0.000196	(0.000121)	(0.0000655
(µg/hr)	Emission Rate, μg/hr	(0.000510)	0.000593	(0.000370)	(0.000198
	Total TCDD				
(ng)	Catch, ng	0.0173	0.013	0.00393	0.0114
(ng/dscm)	Concentration, ng/dscm, as measur	0.00369	0.00270	0.000818	0.0024
(µg/hr)	Emission Rate, µg/hr	0.0111	0.00816	0.00251	0.0072
	12378 PeCDD				
(ng)	Catch, ng	{0.00174}	0.00244	(0.001630)	(0.00139
(ng/dscm)	Concentration, ng/dscm, as measur	{0.000371}	0.000507	(0.000339)	(0.000293
(µg/hr)	Emission Rate, µg/hr	{0.00112}	0.00153	(0.00104)	(0.000884
	Total PeCDD				
(ng)	Catch, ng	0.0413	0.0313	0.0188	0.030
(ng/dscm)	Concentration, ng/dscm, as measur	0.00881	0.00651	0.00391	0.0064
(µg/hr)	Emission Rate, μg/hr	0.0266	0.0196	0.0120	0.019
	123478 HxCDD				
(ng)	Catch, ng	0.00456	{0.00196}	0.00254	{0.0030
(ng/dscm)	Concentration, ng/dscm, as measur	0.000973	{0.000407}	0.000529	{0.00063
(µg/hr)	Emission Rate, μg/hr	0.00294	{0.00123}	0.00162	{0.0019
	123678 HxCDD				
(ng)	Catch, ng	0.00758	{0.00504}	0.00463	{0.0057
(ng/dscm)	Concentration, ng/dscm, as measur	0.00162	{0.00105}	0.000964	{0.0012
(µg/hr)	Emission Rate, µg/hr	0.00488	{0.00316}	0.00295	{0.0036

⁽⁾ Not Detected. Value shown is the detection limit. ND values are used as zero (0) in totals and averages.

^{} Estimated Maximum Possible Concentration. EMPC values ARE included in totals and averages.

Summary of Stack Gas Parameters and Test Results Malcolm Grow Medical Center - Andrews AFB, MD US EPA Test Method 23 - PCDD / PCDF Baghouse Inlet Page 3 of 6

	RUN NUMBER	M-23-1	M-23-2	M-23-3	
	RUN DATE	36922	36922	36923	Average
	RUN TIME	1026-1450	1610-2040	0910-1330	
	EMISSIONS DATA -Continued				
	DIOXINS - Continued				
	123789 HxCDD				
(ng)	Catch, ng	0.00464	0.00276	{0.00225}	{0.00322}
(ng/dscm)	Concentration, ng/dscm, as measur	0.000990	0.000574	{0.000468}	{0.000677}
(µg/hr)	Emission Rate, µg/hr	0.00299	0.00173	{0.00144}	{0.00205}
	Total HxCDD				•
(ng)	Catch, ng	0.0682	0.0429	0.0389	0.0500
(ng/dscm)	Concentration, ng/dscm, as measur	0.0146	0.00892	0.0389	0.0500 0.0105
(µg/hr)	Emission Rate, μg/hr	0.0439	0.0269	0.0248	0.0105
	1234678 HpCDD				
(ng)	Catch, ng	0.0273	0.0215	0.0205	0.0231
(ng/dscm)	Concentration, ng/dscm, as measur	0.00583	0.00447	0.00427	0.0231
(µg/hr)	Emission Rate, μg/hr	0.0176	0.0135	0.0131	0.0147
	Total HpCDD				
(ng)	Catch, ng	0.0556	0.0444	0.0415	0.0472
(ng/dscm)	Concentration, ng/dscm, as measur	0.01186	0.00923	0.00864	0.00991
(µg/hr)	Emission Rate, μg/hr	0.0358	0.0279	0.0265	0.0300
	12346789 OCDD				
(ng)	Catch, ng	0.0744	0.0571	0.0633	0.0649
(ng/dscm)	Concentration, ng/dscm, as measur	0.0159	0.0119	0.0132	0.0136
(µg/hr)	Emission Rate, µg/hr	0.0479	0.0358	0.0404	0.0414
	Total PCDD				
(ng)	Catch, ng	0.2568	0.1887	0.16643	0.2040
(ng/dscm)	Concentration, ng/dscm, as measur	0.0548	0.0392	0.0346	0.0429
(µg/hr)	Emission Rate, µg/hr	0.165	0.118	0.106	0.130

⁽⁾ Not Detected. Value shown is the detection limit. ND values are used as zero (0) in totals and averages.

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Summary of Stack Gas Parameters and Test Results Malcolm Grow Medical Center - Andrews AFB, MD US EPA Test Method 23 - PCDD / PCDF Baghouse Inlet Page 4 of 6

	RUN NUMBER	M-23-1	I-M23-2	I-M23-3	
	RUN DATE	36922	I-M23-2	I-M23-3	Average
	RUN TIME	1026-1450	I-M23-2	I-M23-3	
	EMISSIONS DATA - Continued				
	FURANS				
	2378 TCDF				
(ng)	Catch, ng	0.0113	0.00877	0.00739	0.00915
(ng/dscm)	Concentration, ng/dscm, as measur	0.00241	0.00182	0.00154	0.00192
(µg/hr)	Emission Rate, µg/hr	0.00727	0.00550	0.00471	0.00583
	Total TCDF				
(ng)	Catch, ng	0.345	0.265	0.205	0.272
(ng/dscm)	Concentration, ng/dscm, as measur	0.0736	0.0551	0.0427	0.0571
(µg/hr)	Emission Rate, µg/hr	0.222	0.166	0.131	0.173
	12378 PeCDF				
(ng)	Catch, ng	0.0209	0.0152	0.0116	0.0159
(ng/dscm)	Concentration, ng/dscm, as measur	0.00446	0.00316	0.00241	0.00334
(µg/hr)	Emission Rate, µg/hr	0.0135	0.00954	0.00740	0.0101
	23478 PeCDF				
(ng)	Catch, ng	0.0466	0.0361	0.0265	0.0364
(ng/dscm)	Concentration, ng/dscm, as measur	0.00994	0.00750	0.00552	0.00765
(µg/hr)	Emission Rate, µg/hr	0.0300	0.0227	0.0169	0.0232
	Total PeCDE				
(ng)	Catch, ng	0.451	0.354	0.277	0.3607
(ng/dscm)	Concentration, ng/dscm, as measur	0.0962	0.0736	0.0577	0.07583
(µg/hr)	Emission Rate, µg/hr	0.290	0.222	0.177	0.2297
	123478 HxCDF				
(ng)	Catch, ng	0.0489	0.04	0.0289	0.0393
(ng/dscm)	Concentration, ng/dscm, as measur	0.0104	0.00831	0.00602	0.00825
(µg/hr)	Emission Rate, μg/hr	0.0315	0.0251	0.0184	0.0250

⁽⁾ Not Detected. Value shown is the detection limit. ND values are used as zero (0) in totals and averages.

^{} Estimated Maximum Possible Concentration. EMPC values ARE included in totals and averages.

Summary of Stack Gas Parameters and Test Results Malcolm Grow Medical Center - Andrews AFB, MD US EPA Test Method 23 - PCDD / PCDF Baghouse Inlet Page 5 of 6

	RUN NUMBER	M-23-1	M-23-2	M-23-3	
	RUN DATE	36922	36922	36923	Average
	RUN TIME	1026-1450	1610-2040	0910-1330	
	EMISSIONS DATA - Continued				
	Furans - Continued				
	123678 HxCDF				
(ng)	Catch, ng	0.0546	0.0457	0.0355	0.045
(ng/dscm)	Concentration, ng/dscm, as measur	0.011651	0.009	0.00739	0.00951
(µg/hr)	Emission Rate, μg/hr	0.03515	0.03	0.023	0.0288
	234678 HxCDF				
(ng)	Catch, ng	0.0873	0.0737	0.0602	0.0737
(ng/dscm)	Concentration, ng/dscm, as measur	0.0186	0.0153	0.0125	0.0155
(µg/hr)	Emission Rate, µg/hr	0.0562	0.0463	0.0384	0.0470
	123789 HxCDF				
(ng)	Catch, ng	0.0137	0.0111	0.00899	0.0113
(ng/dscm)	Concentration, ng/dscm, as measur	0.00292	0.00231	0.00187	0.00237
(µg/hr)	Emission Rate, μg/hr	0.00882	0.00697	0.00573	0.00717
	Total HxCDF				
(ng)	Catch, ng	0.517	0.441	0.345	0.434
(ng/dscm)	Concentration, ng/dscm, as measur	0.110	0.0917	0.0718	0.0913
(µg/hr)	Emission Rate, µg/hr	0.333	0.277	0.220	0.277
	1234678 HpCDF				
(ng)	Catch, ng	0.234	0.208	0.172	0.205
(ng/dscm)	Concentration, ng/dscm, as measur	0.0499	0.0432	0.0358	0.0430
(µg/hr)	Emission Rate, μg/hr	0.151	0.131	0.110	0.130
	1234789 HpCDF				
(ng)	Catch, ng	0.0265	0.0222	0.0188	0.0225
(ng/dscm)	Concentration, ng/dscm, as measur	0.00565	0.00461	0.00391	0.00473
(µg/hr)	Emission Rate, µg/hr	0.0171	0.0139	0.0120	0.0143

⁽⁾ Not Detected. Value shown is the detection limit. ND values are used as zero (0) in totals and averages.

^{} Estimated Maximum Possible Concentration. EMPC values ARE included in totals and averages.

Summary of Stack Gas Parameters and Test Results Malcolm Grow Medical Center - Andrews AFB, MD US EPA Test Method 23 - PCDD / PCDF Baghouse Inlet Page 6 of 6

			·····		
	RUN NUMBER	M-23-1	M-23-2	M-23-3	
	RUN DATE	36922	36922	36923	Average
	RUN TIME	1026-1450	1610-2040	0910-1330	
	EMISSIONS DATA - Continued		-		
	Furans - Continued				
	Total HpCDF				
(ng)	Catch, ng	0.37	0.328	0.274	0.324
(ng/dscm)	Concentration, ng/dscm, as measur	0.0790	0.0682	0.0570	0.0681
(µg/hr)	Emission Rate, µg/hr	0.238	0.206	0.175	0.206
	12346789 OCDF				
(ng)	Catch, ng	0.145	0.118	0.113	0.125
(ng/dscm)	Concentration, ng/dscm, as measur	0.0309	0.0245	0.0235	0.0263
(µg/hr)	Emission Rate, µg/hr	0.0934	0.0741	0.0721	0.0798
	Total PCDF				
(ng)	Catch, ng	1.828	1.506	1.214	1.516
(ng/dscm)	Concentration, ng/dscm, as measur	0.390	0.313	0.253	0.319
(µg/hr)	Emission Rate, µg/hr	1.18	0.945	0.774	0.965
	Total PCDD + PCDF				
(ng)	Catch, ng	2.085	1.695	1.380	1.720
(ng/dscm)	Concentration, ng/dscm, as measur	0.445	0.352	0.287	0.361
(µg/hr)	Emission Rate, μg/hr	1.34	1.06	0.881	1.10

⁽⁾ Not Detected. Value shown is the detection limit. ND values are used as zero (0) in totals and averages.

^{} Estimated Maximum Possible Concentration. EMPC values ARE included in totals and averages.

CDD/CDF Corrected Stack Gas Concentrations and 2378 TCDD Toxic Equivalent Concentrations Malcolm Grow Medical Center - Andrews AFB, MD US EPA Test Method 23 - CDD/CDF Medical Waste Incinerator Stack

	1 .		NTRATION		!	2	378 TOXIC E	QUIVALENCI	ES
RUN NUMBER		g/dscmm, adj		02)	2378-TCDD		ng/dscmm, ad		
RUN DATE	M-23-1	M-23-2	M-23-3		Toxic	M-23-1	M-23-2	M-23-3	
RUN TIME	1/31/01	1/31/01	2/1/01	Average	Equivalent	1/31/01	1/31/01	2/1/01	Average
	1026-1450	1610-2040	0910-1330		Factor	1026-1450	1610-2040	0910-1330	
DIOXINS:									
2378 TCDD	(0.000247)	0.000310	(0.000166)	(0.000096)	1.000	(0.000247)	0.000310	(0.000166)	(0.000096
Total TCDD	0.00540	0.00427	0.00113	0.00353				(0.000100)	(0.000030
12378 PeCDD	{0.000543}	0.000801	(0.000467)	(0.000430)	0.500	{0.000272}	0.000401	(0.000234)	(0.000245
Total PeCDD	0.0129	0.0103	0.00539	0.0094			0.000101	(0.000234)	(0.000215
123478 HxCDD	0.00142	{0.000643}	0.000728	{0.000934}	0.100	0.000142	###########	0.0000729	########
123678 HxCDD	0.00237	{0.00165}	0.0013	{0.00178}	0.100	0.000237	{0.000165}	0.0000728	
123789 HxCDD	0.00145	0.000906	{0.000645}	{0.000995}	0.100	0.000145	•	#######################################	{0.000178
Total HxCDD	0.0213	0.0141	0.0111	0.0155			0.0000000	************	**********
1234678 HpCDD	0.00852	0.00706	0.00587	0.00713	0.010	0.0000852	0.0000706	0.0000587	0.0000713
Total HpCDD	0.0174	0.0146	0.0119	0.0146			0.5000100	0.0000367	0.000071
12346789 OCDD	0.0232	0.0187	0.0181	0.0200	0.001	0.0000232	0.0000187	0.0000181	
Total CDD	0.0802	0.0619	0.0477	0.0630		{0.000904}	{0.00112}	{0.000347}	0.0000200
						(Citaboo I)	(0.00112)	(0.000347)	{0.000773
FURANS:									
2378 TCDF	0.00353	0.00288	0.00212	0.00283	0.100	0.000353	0.000288	0.000040	0.000000
Total TCDF	0.108	0.0870	0.0587	0.0839		0.00000	0.000200	0.000212	0.000283
12378 PeCDF	0.00653	0.00499	0.00332	0.00491	0.050	0.000326	0.000250	0.000400	
23478 PeCDF	0.0145	0.0119	0.00759	0.0112	0.500	0.00727	0.000250	0.000166	0.000246
otal PeCDF	0.141	0.116	0.0794	0.111	0.000	0.00121	0.00593	0.00380	0.00562
123478 HxCDF	0.0153	0.0131	0.0083	0.0121	0.100	0.00153	0.00131	0.000000	
123678 HxCDF	0.0170	0.0150	0.0102	0.0140	0.100	0.00170		0.000828	0.00121
234678 HxCDF	0.0273	0.0242	0.0172	0.0227	0.100	0.00170	0.00150	0.00102	0.00140
23789 HxCDF	0.00428	0.00364	0.00258	0.00348	0.100		0.00242	0.00172	0.00227
otal HxCDF	0.161	0.145	0.0988	0.134	0.100	0.000428	0.000364	0.000258	0.000348
234678 HpCDF	0.0731	0.0683	0.0493	0.0631	0.010	0.000724	0.000000	0.000	
234789 HpCDF	0.00827	0.00729	0.00539	0.00694		0.000731	0.000683	0.000493	0.000631
otal HpCDF	0.116	0.108	0.0785	0.100	0.010	0.0000827	0.0000729	0.0000539	0.0000694
2346789 OCDF	0.0453	0.0387	0.0324	0.100	0.004	0.0000450	0.000555		
otal CDF	0.571	0.494	0.348	0.468	0.001				0.0000387
otal CDD + CDF	0.651	0.556				0.0152	0.0129	0.00858	0.0121
Indicates value in pare			0.396	0.531		{0.0161}	{0.0140}	{0.00893}	{0.0130}

⁽⁾ Indicates value in parentheses is based on the Detection Limit (sample was Not Detected). A total or average value in parentheses means the value includes one or more zero (0) values used in place of the detection limit based value.

^{} Indicates the value is based on an EMPC value. The value is used as is in totals and averages.

Summary of Stack Gas Parameters and Test Results Air Emissions Test Malcolm Grow Medical Center - Andrews AFB, MD US EPA Test Method 26 - HCI Medical Waste Incinerator Stack Page 1 of 1

	RUN NUMBER	M26-1	M26-3	M26-4	A
	RUN DATE RUN TIME	1/31/01 1045-1145	2/1/01 0910-1010	2/2/01 0945-1045	Average
	MEASURED DATA				
γ	Meter Box Correction Factor	1.004	1.004	1.004	1.004
P_{bar}	Barometric Pressure, inches Hg	29.90	29.90	29.90	29.90
V_{m}	Sample Volume, ft ³	120.100	119.810	120.440	120.117
ΔΗ	Avg Meter Orifice Pressure, in. H	2.20	2.20	2.20	2.20
T _m	Average Meter Temperature, °F	89.6	109.3	90	96.2
CO ₂	Carbon Dioxide content, % by vol	5.8	6.1	6.3	6.1
O ₂	Oxygen content, % by volume	11.3	11.9	11.6	11.6
Θ	Sample Run Duration, minutes	60	60	60	60
	CALCULATED DATA				
V_{sc}	Standard Meter Volume, liters	116.347	112.056	116.659	115.021
V _{m(std)}	Standard Meter Volume, ft ³	4.109	3.957	4.120	4.062
V _{m(std)}	Standard Meter Volume, m ³	0.116	0.112	0.117	0.115
Q_{m}	Average Sampling Rate, Ipm	1.94	1.87	1.94	1.92
	EMISSIONS DATA				
	Chlorides as HCI				
	Catch Mass, mg	2.8	0.3	1.1	:
F _{Wt}	Formula Weight, lb/lb-mol	36.47	36.47	36.47	
C_{ppmvd}	Concentration, ppm by volume	15.9	1.77	6.22	7.95
C _{ppm7%O2}	Concentration, ppm by vol. at 7%	23.0	2.73	9.29	11.7

APPENDIX E QA/QC DATA

Pacific Environmental Services

Central Park West 5001 South Miami Boulevard, P.O. Box 12077 Research Triangle Park, North Carolina 27709-2077 (919) 941-0333 FAX: (919) 941-0234

PACIFIC ENVIRONMENTAL SERVICES, INC.

ະໄດ້ເປັນຢູ່ເປັນງ່ຽວຮັໄທeter Galibration Form (∃nglish ປິດຖິຣ)

Date: 1/22/01 P_{bar}, in Hg 30.00

Calibrator: DDH Meter Box (DGM) No.:

RMB-15

Reference Meter Correction Factor: 1.0077 (10/5/97, 09/28/98, & 09/10/99)

ΔH =	0.5				Dry Gas	Meter R	MR-15			
	Trial	Gas	Volume (ft ³)				eratures	(°F)	
Trial	Duration			}	Inlet Outlet					
11101	(min)	Initial	Final	Net	Initial	Final	Avg.	Initial	Final	Avg.
2	15	464.354	470.464	6.110	72	73	72.5	70	70	70
3	15 15	470.464	476.579	6.115	72	73	72.5	70	70	70
	15	476.579	482.679	6.100	72	75	73.5	70	71	70.5

		Reference	Meter		DGM Correction	Reference	
	Gas Volume (ft³) Meter Temperatures (°F)						Orifice Press
	Final	Net	Initial Final Avg.			γ	ΔH _@ (in. H ₂ O)
567.537	573.492	5.955	64	64	64	0.995	
573.492	579.425	5.933	64	64			1.719
579.425 585.363 5.938 64 64							1.732 1.726
	Initial 567.537 573.492	Gas Volume Initial Final 567.537 573.492 573.492 579.425	Gas Volume (ft³) Initial Final Net 567.537 573.492 5.955 573.492 579.425 5.933	Initial Final Net Initial 567.537 573.492 5.955 64 573.492 579.425 5.933 64	Gas Volume (ft³) Meter Temperature Initial Final Net Initial Final 567.537 573.492 5.955 64 64 573.492 579.425 5.933 64 64	Gas Volume (ft³) Meter Temperatures (°F) Initial Final Net Initial Final Avg. 567.537 573.492 5.955 64 64 64 573.492 579.425 5.933 64 64 64 579.425 5.933 64 64 64	Gas Volume (ft³) Meter Temperatures (°F) Factor γ Initial Final Net Initial Final Avg. γ 567.537 573.492 5.955 64 64 64 0.995 573.492 579.425 5.933 64 64 64 0.990

ΔH =	0.75				Dry Gas	Meter RI	MB-15				
	Trial	Gas	Volume (ft ³)		Me	ter Temp	eratures	(°F)		
~ · .	Duration					inlet		Outlet			
Trial	(min)	Initial	Final	Net	Initial	Final	Avg.	Initial	Final	Avg.	
1	15	499.123	506.571	7.448	74	74	74	72	72	72	
2	15	506.571	514.037	7.466	74	74	74	72	72		
3	15	514.037	521.456	7.419	74	75	74.5	72	71	72	

		Reference	Meter		DGM Correction	Reference	
		(ft ³)	Meter Te	emperatu			Orifice Press
	Final	Net	Initial	Final	Avg.		$\Delta H_{\mathfrak{C}}$ (in. H_2O)
	96.489	7.255	64	64	64		
	03.728	7.239	64	64			1.733
.728 6	10.967	7.239	64	64	64		1.740 1.740
	itial 0.234 5 0.489 6	Gas Volume itial Final 2.234 596.489 3.489 603.728	Gas Volume (ft³) itial Final Net 0.234 596.489 7.255 0.489 603.728 7.239	Gas Volume (ft³) Meter Te itial Final Net Initial 0.234 596.489 7.255 64 0.489 603.728 7.239 64	Gas Volume (ft³) Meter Temperatu itial Final Net Initial Final 234 596.489 7.255 64 64 3.489 603.728 7.239 64 64	Gas Volume (ft³) Meter Temperatures (°F) itial Final Net Initial Final Avg. .234 596.489 7.255 64 64 64 .489 603.728 7.239 64 64 64 .728 610.967 7.230 64 64 64	Gas Volume (ft³) Meter Temperatures (°F) Factor γ itial Final Net Initial Final Avg. γ .234 596.489 7.255 64 64 64 0.997 .489 603.728 7.239 64 64 64 0.992 .728 610.967 7.239 0.992 0.992

ΔH =	1.0				Dry Gas	Meter R	MB-15			Dry Gas Meter RMB-15									
	Trial	Gas	Volume (ft ³)	Meter Temperatures (°F)														
Trial	Duration				Inlet			Outlet											
Trial	(min)	Initial	Final	Net	Initial	Final	Avg.	Initial	Final	Avg.									
-	10	540.356	546.014	5.658	74	75	74.5	72	72	72									
- 2	10	546.014	551.686	5.672	74	75	74.5	72	72	72									
3	10	551.686	557.344	5.658	74	76	75	72	72	72									

			Reference	DGM Correction	Reference			
Trial	Ga Initial		` '	Meter To		res (°F)	Factor	Orifice Press
11101		Final	Net	Initial Final Avg.			γ	$\Delta H_{\mathbf{Q}}$ (in. H_2O)
	621.021	626.53	5.509	64	64	64	0.996	1.781
3	626.530	632.000	5.470	64	64	64	0.987	1.806
	632.000	632.000 637.500 5.500 64 64 64						1.786



Central Park West 5001 South Miami Boulevard, P.O. Box 12077

Research Triangle Park, North Carolina 27709-2077

PACIFIC ENVIRONMENTAL SERVICES, INC.

(919) 941-0333 FAX: (919) 941-0234

Infielday@esMeer@illordonform(English Units)

Date:

1/22/01

Calibrator: DDH

Meter Box (DGM) No.:

RMB-15

P_{bar}, in Hg 30.00 Reference Meter Correction Factor: 1.0077 (10/5/97, 09/28/98, & 09/10/99)

ΔH =	2.0		Dry Gas Meter RMB-15										
	Trial	Gas	Volume (ft ³)		Me	ter Temp	peratures (°F)					
	Duration				Inlet			Outlet					
Trial	(min)	Initial	Final	Net	Initial	Final	Avg.	Initial	Final	Avg.			
1	7	568.937	574.407	5.470	68	67	67.5	67	67	67			
2	7	574.407	579.882	5.475	68	67	67.5	67	67	67			
3	7	579.882	585.360	5.478	68	67	67.5	67	67	67			

			Reference	Meter			DGM Correction	Reference
	Ga	s Volume	(ft ³)	Factor	Orifice Press			
Trial	Initial	Final	Net	Initial Final Avg.			γ	ΔH_{\odot} (in. H_2O)
1	645.018	650.368	5.350	64	62	63	0.989	1.869
2	650.368	655.738	5.370	64	62	63	0.992	1.855
3	655.738	661.113	5.375	64	62	63	0.992	1.852

ΔH =	4.0				Dry Gas	Meter R	MB-15			
	Trial	Gas	Gas Volume (ft ³) Meter Temperatures (°F)							
	Duration					Inlet			Outlet	
Trial	(min)	Initial	Final	Net	Initial	Final	Avg.	Initial	Final	Avg.
1	5	600.198	605.660	5.462	74	74	74	72	73	72.5
2	5	605.660	611.129	5.469	74	74	74	72	73	72.5
3	5	611.129	616.609	5.480	74	73	73.5	72	73	72.5

			Reference	Meter			DGM Correction	Reference	
	Ga	s Volume	(ft³)	Factor	Orifice Press				
Trial	Initial	Final	Net Initial Final Avg.				γ	ΔH _@ (in. H ₂ O)	
1	680.287	685.679	5.392	64	64	64	1.003	1.873	
2	685.679	691.070	5.391	64	64	64	1.001	1.873	
3	691.070	696.461	5.391	64	64	64	0.999	1.874	

Calibration Results

ΔΗ	γ	ΔH _Q
0.50	0.993	1.73
0.75	0.996	1.74
1.0	0.992	1.79
2.0	0.991	1.86
4.0	1.001	1.87

Dry Gas Meter RMB-15 on 01/22/01

Meter Box Calibration Factor	0.995	
Meter Box Reference Orifice Pressure	1.80	



Central Park West (919) 941-0333 FAX: (919) 941-0234 5001 South Miami Boulevard, P.O. Box 12077 Research Triangle Park, North Carolina 27709-2077

Posttest Dry Gas Meter Calibration Form (English Units)

(10/5/97, 09/28/98, & 09/10/99) 1.0077 29.90 0.995 P_{bar}, in Hg Reference Meter Correction Factor System Vacuum Setting, (in Hg) Pretest Calibration Factor 2/8/01

Calibrator: D. Holzschuh

Meter Box No.: RMB-15

_	L-		_	_	_
	Avg. Outlet	(°F)	75	75	75
	Initial, Outlet Final, Outlet Avg. Outlet	(°F)	74	74	7.4
	Initial, Outlet	(°F)	9/	92	76
r RMB-15	Avg. Inlet	(°F)	75.5	75.5	75
Dry Gas Meter RMB-15	Initial, Inlet Final, Inle	(°F)	75	75	74
٥	Initial, Inlet	(°F)	9/	9/	9/
	Net	(ft ³)	7.720	7.695	7.698
	Final	(ft³)	1005.909	1013.604	1021.302
	Initial	(ft³)	998.189	1005.909	1013.604
1.8	Duration	(min)	10	10	10
= HV		Trial	1	2	က
				_	

			Reference Meter	e Meter	•		Meter Box
)	Gas Volume		Mete	Meter Temperatu	ure	Correction
	Initial	Final	Net	Initial	Final	Avg.	Factor
Trial	(ft³)	(ft³)	(ft³)	(° F)	(°F)	(F)	٨
1	945.198	952.898	7.700	74	74	74	1.003
2	952.898	960.579	7.681	74	74	74	1.004
3	960.579	968.264	7.685	74	74	74	1.003



Printed: 2/13/01



Central Park West Research Triangle Park, North Carolina 27709-2077 (919) 941-0333 FAX: (919) 941-0234 5001 South Miami Boulevard, P.O. Box 12077

Vost Pretest Dry Gas Meter Calibration Form (English Units)

1.004 06/08/00 P_{bar}, in Hg Reference Meter Correction Factor System Vacuum Setting, (in Hg) Pretest Calibration Factor Date:

Calibrator: DDH 30.00

X X က

9-/ Meter Box No.:

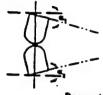
	-		Vost	Vost DGM, liters				Buck Meter, cc/min	r, cc/min	
	Duration	Initial	Final	Net	ဥ	ည	ပ္ပ	ပ္ပ	ည	ပ္ပ
Trial	(min)	Liters	Liters	Liters						
1	10	0	9.712	9.712	979	972	973	974	046	971
2	10	9.712	19.348	9.636	981	126	968	973	971	972
3	10	19.348	28.939	9.591	226	226	696	928	967	978

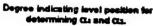
			Refe	Reference Meter	ڀ			
			Gas Vol	Gas Volume, cc/minute	nute			
						AVG	Average	
Trial	သ	ည	သ	ည	ပ္ပ	CC/min	lpm	γ
1	972	980	696	972	977	973.55	9.735	1.002
2	981	985	586	286	026	976.27	9.763	1.013
က	886	981	886	066	974	976.55	9.765	1.018

• • • % Change SARRIAR



CALIBRATION DATA SHEET 2 Type S Pitot Tube Inspection









Degree indicating level position for determining β_1 and β_2 .



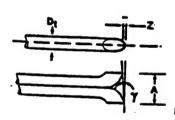


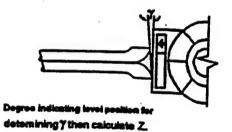
Degree indicating level position for determining (4)



Level and Perpendicular?	Yes
Obstruction?	No
Damaged?	14.0
$a_1 (-10^{\circ} \le a_1 \le +10^{\circ})$	O
$a_2 (-10^{\circ} \le a_2 \le +10^{\circ})$	
8, (-5° × 8, × +5°)	0
& (-5° 5 & 5 5 +5°)	
y	0
0	0
z = A tan y (≤ 0.125°)	O
w = A tan θ (≤ 0.03125°)	. 0
D, (3/16" \$ D, \$ 3/8")	3/8
Α .	. 935
A/2D, $(1.05 \le P_A/D, \le 1.5)$	1.25

Teem Leeder (Signature/Date)





QA/QC Check Completeness		A -		
Cartification	consulty	Accuracy	Specifications	Reasonableness
I certify that th	ne Type S pitot tube/pro applicable design featur	be IDF RF- 4	meets or exceed	is all specifications,
Certified by: _	. D Brown	7-14-48	pitot tube calbration factor	C _p of 0.84.
	Personnel (Signa	iture/Date)	T	

TEMPERATURE SENSOR CALIBRATION FORM

Temperature Sensor No. RT-6 Sensor Type K TYPE Length 97

Ambient Temp. °F 68 Barometric Pressure, "Hg 29.95

Reference Temp. Sensor: 68

Date	Ref. Point	Temp. Source	Ten	np. °F	Temp.	Within	Calibrated
	No.		Ref. Sensor	Test Sensor	Diff. %	Limits Y/N	Ву
02/14/59	1	TLE	32	3.5	0	7	наа
	2	ANSTER AIR	71	C8	7.65	Ÿ	Haid
	3	Briting Nao	حرد	210	6	y	DOH
	1						
	2	·					
	3						
	1						
	2			•			
	3		·				
	1						
	2						
	3						
	1						
·	2						
	3						
	1						
	2						
	3						

[%] Temp. Diff = $\frac{(Ref. Temp + 460) - (Test Temp. + 460)}{(Ref. Temp. + 460)} \times 100 \le 1.5$ %



3434 Route 22 West • Branchburg, NJ 08876 USA Tel.: (908) 252-9300 • (800) 932-0624 • Fax: (908) 252-0811 Shipped From: 80 Industrial Drive • Alpha, NJ 08865



CERTIFICATE	OF AI	VAL	YSIS
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EPA PROTOCOL MIXTURE

PROCEDURE #: G1

CUSTOMER:

Pacific Env. Services Inc.

CYLINDER #:

CC88665

SGI ORDER #:

147414

CYLINDER PRES: 2000 PSIG

ITEM#:

CGA OUTLET:

350

P.O.#:

104-00-0061/62/63

CERTIFICATION DATE: 11/02/99

EXPIRATION DATE:

11/02/2002

CERTIFICATION HISTORY

COMPONENT	DATE OF ASSAY	MEAN CONCENTRATION	CERTIFIED CONCENTRATION	ANALYTICAL ACCURACY
Carbon Monoxide	10/26/99 11/02/99	30.42 ppm 30.09 ppm	30.2 ppm	+/- 1%

BALANCE

Nitrogen

PREVIOUS CERTIFICATION DATES: None

REFERENCE STANDARDS

COMPONENT	SRM/NTRM#	CYLINDER#	CONCENTRATION
Carbon Monoxide	NTRM-81679	CC88366	97.4 ppm

INSTRUMENTATION

COMPONENT	MAKE/MODEL	SERIAL#	DETECTOR	CALIBRATION DATE(S)
Carbon Monoxide	Horiba VIA-510	570423011	NDIR	10/26/99

THIS STANDARD WAS CERTIFIED ACCORDING TO THE EPA PROTOCOL PROCEDURES. DO NOT USE THIS STANDARD IF THE CYLINDER PRESSURE IS LESS THAN 150 PSIG.

ANALYST:

DATE: 11/02/99



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CERTIF	IUA		IF A	ı١١	IAL	_ 1 3	IJ

EPA PROTOCOL MIXTURE

PROCEDURE #: G1

CUSTOMER:

Pacific Env. Services Inc.

CYLINDER #:

CC88530

SGI ORDER #:

147414

CYLINDER PRES: 2000 PSIG

CGA OUTLET:

350

ITEM#: P.O.#:

104-00-0061/62/63

CERTIFICATION DATE: 11/02/99

EXPIRATION DATE:

11/02/2002

CERTIFICATION HISTORY

ASSAY	CONCENTRATION	CONCINICAL RATE OF A	
		CONCENTRATION	ACCURACY
10/26/99	59.64 ppm	59.5 ppm	+/- 1%
11/02/99	59.31 ppm		
			'

BALANCE

Nitrogen

PREVIOUS CERTIFICATION DATES: None

DEEDENCE CTANDADDO

COMPONENT	SRM/NTRM#	CYLINDER#	CONCENTRATION
Carbon Monoxide	NTRM-81679	CC88366	97.4 ppm

INSTRUMENTATION

COMPONENT	MAKE/MODEL	SERIAL#	DETECTOR	CALIBRATION DATE(S)
Carbon Monoxide	Horiba VIA-510	570423011	NDIR	10/26/99
	-			
	 			

THIS STANDARD WAS CERTIFIED ACCORDING TO THE EPA PROTOCOL PROCEDURES. DO NOT USE THIS STANDARD IF THE CYLINDER PRESSURE IS LESS THAN 160 PSIG.

ANALYST: FRED PIKULA

DATE: 11/02/99



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	CERTI	FICA.	TE C	FA	NA	LYSIS
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EPA PROTOCOL MIXTURE

PROCEDURE #: G1

CUSTOMER:

Pacific Env. Services Inc.

CYLINDER #:

CC88495

SGI ORDER #:

147414

CYLINDER PRES: 2000 PSIG

ITEM#:

5

CGA OUTLET:

350

P.O.#:

104-00-0061/62/63

CERTIFICATION DATE: 11/02/99

11/02/33

EXPIRATION DATE:

11/02/2002

CERTIFICATION HISTORY

COMPONENT	DATE OF ASSAY	MEAN CONCENTRATION	CERTIFIED CONCENTRATION	ANALYTICAL ACCURACY
Carbon Monoxide	10/26/99 11/02/99	89.79 ppm . 89.60 ppm	89.7 ppm	+/- 1%
•				

BALANCE

Nitrogen

PREVIOUS CERTIFICATION DATES: None

REFERENCE STANDARDS

COMPONENT	SRM/NTRM#	CYLINDER#	CONCENTRATION
Carbon Monoxide	NTRM-81679	CC88366	97.4 ppm
			'\
			·

INSTRUMENTATION

COMPONENT	MAKE/MODEL	SERIAL#	DETECTOR	CALIBRATION DATE(S)
Carbon Monoxide	Horiba VIA-510	570423011	NDIR	10/26/99

THIS STANDARD WAS CERTIFIED ACCORDING TO THE EPA PROTOCOL PROCEDURES. DO NOT USE THIS STANDARD IF THE CYLINDER PRESSURE IS LESS THAN 150 PSIG.

ANALYST:	/)//-	
	FRED PIKITI A	•

DA.	TE:	1	1	/0	2/	99



3434 Route 22 West • Branchburg, NJ 08876 USA Tel.: (908) 252-9300 • (800) 932-0624 • Fax: (908) 252-0811 Shipped From: 80 Industrial Drive • Alpha, NJ 08865



CERTIFICATE OF ANALYSIS

EPA PROTOCOL MIXTURE

PROCEDURE #: G1

CUSTOMER:

Pacific Env. Services Inc.

CYLINDER #:

CC114216

SGI ORDER #:

162038

ITEM#:

CGA OUTLET:

CYLINDER PRES: 2000 PSIG

P.O.#:

590

104-01-0017

CERTIFICATION DATE: 12/28/2000

EXPIRATION DATE:

12/28/2003

CERTIFICATION HISTORY

COMPONENT	DATE OF ASSAY	MEAN CONCENTRATION	CERTIFIED CONCENTRATION	ANALYTICAL ACCURACY
Oxygen	12/28/2000	12.53 %	12.53 %	+/- 1%
Carbon Dioxide	12/28/2000	10.04 %	10.04 %	+/- 1%

BALANCE

Nitrogen

PREVIOUS CERTIFICATION DATES: None

REFERENCE STANDARDS

COMPONENT	SRM/NTRM#	CYLINDER#	CONCENTRATION
Oxygen	NTRM-82659x	CC83908	22.8 %
Carbon Dioxide	NTRM-82745x	CC79944	20.00 %

INSTRUMENTATION

MAKE/MODEL	SERIAL#	DETECTOR	CALIBRATION DATE(S)
Horiba MPA-510	570694081	PM	12/15/2000
Horiba VIA-510	571417045	NDIR	12/6/2000

THIS STANDARD IS NIST TRACEABLE. IT WAS CERTIFIED ACCORDING TO THE EPA PROTOCOL PROCEDURES. DO NOT USE THIS STANDARD IF THE CYLINDER PRESSURE IS LESS THAN 150 PSIG.

ANALYST:	7/.
	FRED PIKULA

DATE: 12/28/2000





3434 Route 22 West • Branchburg, NJ 08876 USA Tel.: (908) 252-9300 • (800) 932-0624 • Fax: (908) 252-0811 Shipped From: 80 Industrial Drive • Alpha, NJ 08865

CERTIFICATE	OF ANALYSIS
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EPA PROTOCOL MIXTURE

PROCEDURE #: G2

CUSTOMER:

Pacific Env. Services Inc.

CYLINDER #: *

CC91083

SGI ORDER #:

147409

CYLINDER PRES: 2000 PSIG

ITEM#:

CGA OUTLET:

590

P.O.#:

104-00-0063/0064

CERTIFICATION DATE: 10/27/99

EXPIRATION DATE:

10/27/2002

CERTIFICATION HISTORY

COMPONENT	DATE OF ASSAY	MEAN CONCENTRATION	CERTIFIED CONCENTRATION	ANALYTICAL ACCURACY
Oxygen	10/27/99	22.4 %	22.4 %	+/- 1%
Carbon Dioxide	10/27/99	22.4 %	22.4 %	+/- 1%

BALANCE

Nitrogen

PREVIOUS CERTIFICATION DATES: None

REFERENCE STANDARDS

COMPONENT	SRM/NTRM#	CYLINDER#	CONCENTRATION
Oxygen	NTRM-82659X	CC83900	22.80 %
Carbon Dioxide	NTRM-82745x	CC79944	20.00 %

INSTRUMENTATION

COMPONENT	MAKE/MODEL	SERIAL#	DETECTOR	CALIBRATION DATE(S)
Oxygen	Horiba MPA-510	570694081	PM	10/26/99
Carbon Dioxide	Horiba VIA-510	571417045	NDIR	10/27/99

THIS STANDARD WAS CERTIFIED ACCORDING TO THE EPA PROTOCOL PROCEDURES. DO NOT USE THIS STANDARD IF THE CYLINDER PRESSURE IS LESS THAN 150 PSIG.

ANALYST:

DATE: 10/27/99



3434 Route 22 West • Branchburg, NJ 08876 USA Tel.: (908) 252-9300 • (800) 932-0624 • Fax: (908) 252-0811 Shipped From: 80 Industrial Drive • Alpha, NJ 08865



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EPA PROTOCOL MIXTURE

PROCEDURE #: G1

CUSTOMER:

Cherokee Instruments Inc.

CYLINDER #:

CC55783

SGI ORDER #:

156722 CYLINDER PRES: 2000 PSIG

ITEM#:

6

CGA OUTLET: 660

P.O.#:

3818

CERTIFICATION DATE: 8/10/2000 EXPIRATION DATE:

8/10/2002

CERTIFICATION HISTORY

COMPONENT	DATE OF ASSAY	MEAN CONCENTRATION	CERTIFIED CONCENTRATION	ANALYTICAL ACCURACY
Sulfur Dioxide	8/2/2000 8/10/2000	45.04 ppm 45.17 ppm	45.1 ppm	+/- 1%

BALANCE

Nitrogen

PREVIOUS CERTIFICATION DATES: None

REFERENCE STANDARDS

COMPONENT	SRM/NTRM#	CYLINDER#	CONCENTRATION
Sulfur Dioxide	NTRM-81694	CC55796	96.0 ppm

INSTRUMENTATION

COMPONENT	MAKE/MODEL	SERIAL#	DETECTOR	CALIBRATION DATE(S)
Sulfur Dioxide	Horiba VIA-510	851221093	NDIR	7/28/2000

THIS STANDARD WAS CERTIFIED ACCORDING TO THE EPA PROTOCOL PROCEDURES. DO NOT USE THIS STANDARD IF THE CYLINDER PRESSURE IS LESS THAN 150 PSIG.

ANALYST: FRED PIKULA

DATE: 8/10/2000

For Technical Information Call 1-800-752-1597 Air Products and Chemicals, Inc. * 12722 S. Wentworth Avenue, Chicago, IL 50628

PRODUCTS

ISO CERTIFICATION: 9002

EPA PROTOCOL GAS STANDARI **SERTIFICATE OF ANALYSIS:**

PERFORMED ACCORDING TO EPA TRACEABILITY PROTOCOL FOR ASSAY AND CERTIFICATION OF GASEOUS CALIBRATION STANDARDS (PROCEDURE #G1)

AIR PRODUCTS AND CHEMICALS, INC. NC 27709 4822 INDUSTRY LAND UDI BUSINESS FARK Customers DURHAM

Order No: C85-190592-01 Batch No: 861-59105 Releaser Ž

क्राम Cert Cy11 Ber

EG9119904BAL DWJ098	2000 ps1g 06/26/1999 06/26/2001
Inder Nos	Inder Pressurets Lification Dates Lation Dates

CERTIFIED CA	Certified Concentration	KET	Keperizace standaeds	e dan	•	AKALYZICAL INSTRUMENTATION	THE TRUBERY	LEIOH
	Certified	Cyl Inder	Standard	Standerd	Instrument	Serial	1,350	Kebsurenent
Component	Concentration	Kurber	Type	Concentration	Make/Model	Kaber	Celibration	Principal
SULFUR DIOXIDE	91.7 ±1.7 PPM	SC91509688AL	MTRN 81661X	169.7 PPM	HORIBA VIA-510	85079208	69/18/99	05/16/99 NON DISPERSIVE INFRARED
HI TROCEIL	Palarive Oas							
* STANDARD	* STANDARD SECULD NOT BE USED BELOW	E USED BELOW 1!	150 PBIG					



Analysti

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drand Fry

RATA CLASS



Scott Specialty Gases

Dual-Analyzed Calibration Standard

1290 COMBERMERE STREET, TROY, MI 48083

Phone: 248-589-2950

Fax: 248-589-2134

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory

TROY,MI 48083

P.O. No.:

103-00-292

Project No.: 05-70839-002

Customer

PACIFIC ENVIRONMENTAL SERVICES.INC

BRUCE SAVEN

7209 E. KEMPER RD

CINCINNATI OH 45249-1030

ANALYTICAL INFORMATION

SCOTT SPECIALTY GASES

1290 COMBERMERE STREET

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards;

Procedure #G1; September, 1997.

Cylinder Number:

ALM031852

Certification Date:

12/14/00

Exp. Date: 12/13/2002

Cylinder Pressure ***: 1900 PSIG

ANALYTICAL

TRACEABILITY

COMPONENT NITRIC OXIDE **CERTIFIED CONCENTRATION (Moles)**

ACCURACY** +/- 1%

Direct NIST and NMi

NITROGEN - OXYGEN FREE

254.13 PPM

BALANCE

Reference Value Only

TOTAL OXIDES OF NITROGEN

254.9

PPM

"" Do not use when cylinder pressure is below 150 paig.

** Analytical accuracy is based on the requirements of EPA Protocal procedure G1, September 1997.

Product certified as +/- 1% analytical accuracy is directly traceable to NIST or NMI standards.

REFERENCE STANDARD

TYPE/SRM NO. NTRM 1687

3/01/03

EXPIRATION DATE . CYLINDER NUMBER

ALM024630

CONCENTRATION

COMPONENT

NITRIC OXIDE

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#

BECKMAN/951/010177

DATE LAST CALIBRATED

1000. PPM

12/14/00

ANALYTICAL PRINCIPLE

CHEMILUMINESCENCE

ANALYZER READINGS

(Z = Zero Gas

R = Reference Gas T = Test Gas r = Correlation Coefficient)

First Triad Analysis

Second Triad Analysis

Calibration Curve

Concentration = A + Bx + Cx2 + Dx3 + Ex4

NITRIC OXIDE

Date:12/06/00 Response Unit:MV

Z1 - 0.00000 R1 = 100.0000RZ - 100,0000

22 = 0.00000

T3 ~ 101.E000

T1 = 101,7000 T2 = 101.5000 R3 = 100.0000

Avg. Concentration:

23 = 0.00000

253.4

Date: 12/14/00 Response Unit: MV

Z1 = 0.00000R1 = 100,0000 T1 = 51.60000

R2 = 100.0000

ZZ-0.00000 T2 = 51.60000

Z3 = 0,00000 73 - 51.50000 R3 - 100.0000

Avg. Concentration:

r=.999992785 1686

COMMINANTS A=1.220822425

8-10.000876060

E=0

APPROVED BY:



14:01

RATA CLASS



Scott Specialty Gases

Dual-Analyzed Calibration Standard

290 COMBERMERE STREET, TROY, MI 48083

Phone: 248-589-2950

Fex: 248-589-2134

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory

TROY, MI 48083

P.O. No.:

103-00-292

Project No.: 05-70839-003

PACIFIC ENVIRONMENTAL SERVICES, INC

BRUCE SAVEN

7209 E. KEMPER RD

CINCINNATI OH 45249-1030

ANALYTICAL INFORMATION

SCOTT SPECIALTY GASES

1290 COMBERMERE STREET

his certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards;

Procedure #G1; September, 1997.

Cylinder Number: Cylinder Pressure***: AAL18927

1900 PSIG

Certification Date:

12/14/00

Exp. Date: 12/14/2002

ANALYTICAL

COMPONENT

CERTIFIED CONCENTRATION (Moles)

ACCURACY**

TRACEABILITY

NITRIC OXIDE

472.4 PPM

+/- 1%

Direct NIST and NMi

NITROGEN - OXYGEN FREE

TOTAL OXIDES OF NITROGEN

473.1

PPM

BALANCE

Reference Value Only

*** Do not use when cylinder pressure is below 150 psig.

** Analytical accuracy is based on the requirements of EPA Protocal procedure G1, September 1997.

Product certified as +/- 1% analytical accuracy is directly traceable to NIST or NMI standards.

REFERENCE STANDARD

TYPE/SRM NO.

EXPIRATION DATE

CYLINDER NUMBER

CONCENTRATION

COMPONENT

NTRM 1687

3/01/03

ALM024630

1000. PPM

NITRIC OXIDE

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#

DATE LAST CALIBRATED

ANALYTICAL PRINCIPLE

BECKMAN/951/010177

12/14/00

CHEMILUMINESCENCE

ANALYZER READINGS

(Z = Zero Gas

R=Reference Gas T=Test Gas

r = Correlation Coefficient)

First Triad Analysis

Second Triad Analysis

Calibration Curve

Concentration = A + Bx + Cx2 + Dx3 + Ex4

NITRIC OXIDE

Dete:12/06/00 R2 = 100.0000

Avg. Concentration:

Response Unit:MV

472.1

21 - 0.00000 R1 = 100.0000

Z3 = 0.00000

Z2 = 0.00000 T3-47.00000

R3 = 100,0000 PPM

T1 = 47.00000 T2 = 47.00000 Date: 12/14/00

Response Unit: MV

R1 = 100.0000

Z1 = 0.00000 R2 = 100,0000 Z2-0.00000

T2-47.10000

Z3-0.00000

Avg. Concentration:

T3-47.10000 . R3-100.0000 472.8

A=1.220822425

B = 10.000876060

--- -998992785

Constants:

C=0

E=0